(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 516 877 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
23.03.2005 Bulletin 2005/12

(21) Application number: **04015656.4**

(22) Date of filing: **15.03.2000**

(51) Int Cl.[7]: **C07D 263/56**, A61K 31/42, C07D 263/34, C07D 413/12, A61K 31/44, C07D 213/40, C07D 209/14, C07D 307/81, A61P 37/00, A61P 9/00

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **15.03.1999 US 124421 P**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
00916397.3 / 1 161 422

(71) Applicant: **AXYS PHARMACEUTICALS, INC.**
South San Francisco, CA 94080 (US)

(72) Inventors:
- **Martichonok, Valeri**
  San Francisco California 94132 (US)
- **Burgess-Henry, Jana**
  Chico California 95926 (US)
- **Graupe, Michael**
  Pacifica California 94044 (US)
- **Link, John O.**
  San Francisco California 94110 (US)
- **McDowell, Robert S.**
  San Francisco California 94114 (US)
- **McGrath, Mary E.**
  Burlingame California 94010 (US)
- **Mossman, Craig J.**
  Campbell California 95008 (US)
- **Patterson, John W.**
  Mountain View California 94049 (US)
- **Saunders, Oliver L.**
  Burlingame California 94010 (US)
- **Zipfel, Sheila M.**
  Mountain View California 94043 (US)
- **Martelli, Arnold J.**
  Burlington California 94010 (US)
- **Lai, Justine**
  Epping Essex CM164QA (GB)
- **Aldous, David J.**
  Gillette New Jersey 07933 (US)
- **Halley, Frank**
  Sevres 82310 (FR)
- **Pickett, Stephen D.**
  Hitchen Herts SG4 9RA (GB)
- **Thurairatnam, Sukanthini**
  Bedminster New Jersey 07921 (US)
- **Timm, Andreas P.**
  Bridgewater New Jersey 07933 (US)

(74) Representative: **Thomson, Paul Anthony et al**
Potts, Kerr & Co.
15, Hamilton Square
Birkenhead Merseyside CH41 6BR (GB)

Remarks:
This application was filed on 02 - 07 - 2004 as a divisional application to the application mentioned under INID code 62.

(54) Amine derivatives as protease inhibitors

(57) The present invention relates to novel alkanoyl-substituted heterocyclic derivatives which are cysteine protease inhibitors; the pharmaceutically acceptable salts and N-oxides thereof; their uses as therapeutic agents and the methods of their making; according to Formal (I) in which: A comprises a heteromonocyclic ring containing 5 to 6 ring member atoms or a fused heteropolycyclic ring system containing 8 to 14 ring member atoms, wherein each ring contains 5 to 7 ring member atoms, X^1 is a ring member carbon atom and each ring member other than X^1 is a carbon atom or a heteroatom, with the proviso that (i) at least one ring member atom is a heteroatom and (ii) when A is a heteromonocyclic radical containing 5 ring member atoms, no more than two of the ring member atoms comprising A are heteroatoms; n is 0, 1, 2 or 3; X^1 is =C- or -CH-; X^2 is a bond or a divalent group of Formula (a) or (b); R^1 - R^8= as in the application.

EP 1 516 877 A1

BEST AVAILABLE COPY

Description

THE INVENTION

[0001] This application relates to compounds and compositions for treating diseases associated with cysteine protease activity, particularly diseases associated with activity of cathepsins B, K, L or S.

DESCRIPTION OF THE FIELD

[0002] Cysteine proteases represent a class of peptidases characterized by the presence of a cysteine residue in the catalytic site of the enzyme. Cysteine proteases are associated with the normal degradation and processing of proteins. The aberrant activity of cysteine proteases, e.g. as a result of increased expression or enhanced activation, however, may have pathological consequences. In this regard, certain cysteine proteases are associated with a number of disease states, including arthritis, muscular dystrophy, inflammation, tumor invasion, glomerulonephritis, malaria, periodontal disease, metachromatic leukodystrophy and others. For example, increased cathepsin B levels and redistribution of the enzyme are found in tumors; thus, suggesting a role for the enzyme in tumor invasion and metastasis. In addition, aberrant cathepsin B activity is implicated in such disease states as rheumatoid arthritis, osteo arthritis, pneumocystis carinii, acute pancreatitis, inflammatory airway disease and bone and joint disorders.

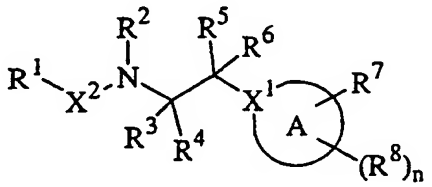
[0003] The prominent expression of cathepsin K in osteoclasts and osteoclast-related multinucleated cells and its high collagenolytic activity suggest that the enzyme is involved in ososteoclast-mediated bone resorption and, hence, in bone abnormalities such as occurs in osteoporosis. In addition, cathepsin K expression in the lung and its elastinolytic activity suggest that the enzyme plays a role in pulmonary disorders as well.

[0004] Cathepsin L is implicated in normal lysosomal proteolysis as well as several disease states, including, but not limited to, metastasis of melanomas. Cathepsin S is implicated in Alzheimer's disease and certain autoimmune disorders, including, but not limited to juvenile onset diabetes, multiple sclerosis, pemphigus vulgaris, Graves' disease, myasthenia gravis, systemic lupus erythemotasus, rheumatoid arthritis and Hashimoto's thyroiditis; allergic disorders, including, but not limited to asthma; and allogeneic immune responses, including, but not limited to, rejection of organ transplants or tissue grafts.

[0005] In view of the number of diseases wherein it is recognized that an increase in cysteine protease activity contributes to the pathology and/or symptomatology of the disease, molecules which are shown to inhibit the activity of this class of enzymes, in particular molecules which are inhibitors of cathepsins B, K, L and/or S, will be useful as therapeutic agents.

SUMMARY OF THE INVENTION

[0006] In one particular embodiment, the present invention relates to protease inhibitors of Formula I:



I

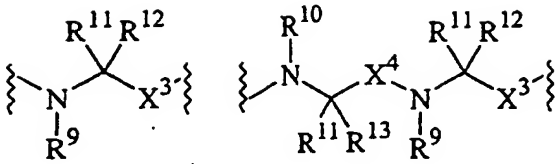
in which:

A comprises a heteromonocyclic ring containing 5 to 6 ring member atoms or a fused heteropolycyclic ring system containing 8 to 14 ring member atoms, wherein each ring contains 5 to 7 ring member atoms, X^1 is a ring member carbon atom and each ring member atom other than X^1 is a carbon atom or a heteroatom, with the proviso that (i) at least one ring member atom is a heteroatom and (ii) when A is a heteromonocyclic radical containing 5 ring member atoms, no more than two of the ring member atoms comprising A are heteroatoms;

n is 0, 1, 2 or 3;

X^1 is =C- or -CH-;

X^2 is a bond or a divalent group of Formula (a) or (b):



(a) (b)

wherein:

X^3 and X^4 independently are -C(O)- or $-CH_2S(O)_2-$

R^9 and R^{10} independently are hydrogen, (C_{1-6})alkyl or as defined below;

R^{11} at each occurrence independently is hydrogen or (C_{1-6})alkyl;

R^{12} and R^{13} independently are (i) (C_{1-6})alkyl optionally substituted with cyano, halo, nitro, $-NR^{14}R^{14}$, $-NR^{14}C(O)OR^{14}$, $-NR^{14}C(O)NR^{14}R^{14}$, $-NR^{14}C(NR^{14})NR^{14}R^{14}$, $-OR^{14}$, $-SR^{14}$, $-C(O)OR^{14}$, $-C(O)NR^{14}R^{14}$, $-S(O)_2NR^{14}R^{14}$, $-P(O)(OR^{14})OR^{14}$, $-OP(O)(OR^{14})OR^{14}$, $-NR^{14}C(O)R^{15}$, $-S(O)R^{15}$, $-S(O)_2R^{15}$, $-C(O)R^{15}$, $-OR^{16}$, $-SR^{16}$, $-S(O)R^{16}$, $-S(O)_2R^{16}$, $-C(O)R^{16}$, $-C(O)OR)^{16}$, $-OC(O)R^{16}$, $-NR^{16}R^{17}$, $-NR^{17}C(O)R^{16}$, $-NR^{17}C(O)OR^{16}$, $-C(O)NR^{16}R^{17}$, $-S(O)_2NR^{16}R^{17}$, $-NR^{17}C(O)NR^{16}R^{17}$ or $-NR^{17}C(NR^{17})NR^{16}R^{17}$, wherein R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, R^{15} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, halo, (C_{1-6})alkyl or R^{16} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl and R^{17} is hydrogen or (C_{1-6})alkyl, and wherein within R^{16} said cycloalkyl, heterocycloalkyl, aryl, heteroaryl, polycycloaryl or heterpolycycloaryl ring optionally is substituted by a group selected from $-R^{18}$, $-X^5OR^{18}$, $-X^5SR^{18}$, $-X^5S(O)R^{18}$, $-X^5S(O)_2R^{18}$, $-X^5C(O)R^{18}$, $-X^5C(O)OR^{18}$, $-X^5OC(O)R^{18}$, $-X^5NR^{18}R^{19}$, $-X^5NR^{19}C(O)R^{18}$, $-X^5NR^{19}C(O)OR^{18}$ $-X^5C(O)NR^{18}R^{19}$, $-X^5S(O)_2NR^{18}R^{19}$, $-X^5NR^{19}C(O)NR^{18}R^{19}$ or $-X^5NR^{19}C(NR^{19})NR^{18}R^{19}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{18} is hydrogen or (C_{1-6})alkyl and R^{19} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl, or (ii) a group selected from (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl and hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl, wherein said cycloalkyl, heterocycloalkyl, aryl, heteroaryl, polycycloaryl or heterpolycycloaryl ring optionally is substituted by a group selected from $-R^{18}$, $-X^5OR^{18}$, $-X^5SR^{18}$, $-X^5S(O)R^{18}$, $-X^5S(O)_2R^{18}$, $-X^5C(O)R^{18}$, $-X^5C(O)OR^{18}$, $-X^5OC(O)R^{18}$, $-X^5NR^{18}R^{19}$, $-X^5NR^{19}C(O)R^{18}$, $-X^5NR^{19}C(O)OR^{18}$, $-X^5C(O)NR^{18}R^{19}$, $-X^5S(O)_2NR^{18}R^{19}$, $-X^5NR^{19}C(O)NR^{18}R^{19}$ or $-X^5NR^{19}C(NR^{19})NR^{18}R^{19}$, wherein X^5, R^{18} and R^{19} are as defined above; wherein within R^{12} and/or R^{13} any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$ $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; or

R^{12} together with R^9 and/or R^{13} together with R^{10} form trimethylene, tetramethylene or phenylene-1,2-dimethylene, optionally substituted with 1 to 3 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, oxo, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; and

[0007] R^1 is $-X^6X^7R^{20}$, wherein X^6 is -C(O)-, -C(O)C(O)- or $-S(O)_2-$, X^7 is a bond, -O- or $-NR^{21}-$, wherein R^{21} is hydrogen or (C_{1-6})alkyl, and R^{20} is (i) (C_{1-6})alkyl optionally substituted by cyano, halo, nitro, $-NR^{14}R^{14}$, $-NR^{14}C(O)OR^{14}$, $-NR^{14}C(O)NR^{14}R^{14}$ $-NR^{14}C(NR^{14})NR^{14}R^{14}$, $-OR^{14}$, $-SR^{14}$, $-C(O)OR^{14}$, $-C(O)NR^{14}R^{14}$, $-S(O)_2NR^{14}R^{14}$, $-P(O)(OR^{14})OR^{14}$, $-OP(O)(OR^{14})OR^{14}$, $-NR^{14}C(O)R^{15}$, $-S(O)R^{15}$ $-S(O)_2R^{15}$, $-C(O)R^{15}$ $-OR^{22}$, $-SR^{22}$, $-S(O)R^{22}$, $-S(O)_2R^{22}$, $-C(O)R^{22}$, $-C(O)OR^{22}$, $-C(O)NR^{22}R^{23}$, $-NR^{22}R^{23}$, $-NR^{23}C(O)R^{22}$, $-NR^{23}C(O)OR^{22}$, $-NR^{23}C(O)NR^{22}R^{23}$ or $-NR^{23}C(NR^{23})NR^{22}R^{23}$, wherein R^{14} and R^{15} are as defined above, R^{22} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})bicycloaryl(C_{0-6})alkyl or hetero(C_{8-12})bicycloaryl(C_{0-6})alkyl and R^{23} at each occurrence independently is hydrogen or (C_{1-6})alkyl, or (ii) (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})bicycloaryl(C_{0-6})alkyl or hetero(C_{8-12})bicycloaryl(C_{0-6})alkyl or (iii) (C_{3-6})Cycloalkyl(C_{0-6})alkyl, hetero(C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6})alkyl or hetero(C_{5-6})aryl(C_{0-6})alkyl, wherein said cycloalkyl, heterocycloalkyl, phenyl or heteroaryl is substituted by

$-R^{24}$,$-X^5OR^{24}$, $-X^5SR^{24}$, $-X^5S(O)R^{24}$, $-X^5S(O)_2R^{24}$, $-X^5C(O)R^{24}$, $-X^5C(O)OR^{24}$, $-X^5C(O)NR^{24}R^{25}$, $-X^5$ $NR^{24}R^{25}$, $-X^5NR^{25}C(O)R^{24}$, $-X^5NR^{25}C(O)OR^{24}$, $-X^5NR^{25}C(O)NR^{24}R^{25}$ or $-X^5NR^{25}C(NR^{25})NR^{24}R^{25}$, wherein X^5 is as defined above, R^{24} is (C_{3-6})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6})alkyl or hetero(C_{5-6})aryl(C_{0-6}) alkyl and R^{25} at each occurrence independently is hydrogen or (C_{1-6})alkyl; wherein within R^1 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})$ $OR)^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; or when X^2 is a divalent group of formula (a) or (b) then R^1 may also represent hydrogen, carboxy, oxalo or carbamoyl;

R^2 is hydrogen or (C_{1-6})alkyl;

R^3 is (i) (C_{1-6})alkyl optionally substituted with cyano, halo, nitro, $-SR^{26}$, $-C(O)OR^{26}$, $-C(O)NR^{26}R^{26}$, $-P(O)(OR^{26})$ OR^{26}, $-OP(O)(OR^{26})OR^{26}$, $-S(O)R^{27}$, $-S(O)_2R^{27}$ or $-C(O)R^{27}$, wherein R^{26} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{27} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, or (ii) (C_{5-6})cycloalkyl (C_{2-3})alkyl, hetero(C_{3-6})cycloalkyl(C_{2-3})alkyl, (C_{6-12})aryl(C_{2-3})alkyl or hetero(C_{5-6})aryl(C_{2-3})alkyl, wherein said cycloalkyl, heterocycloalkyl, aryl or heteroaryl optionally is substituted further with 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)$ $NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)$ $(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above, provided that when R^3 is unsubstituted (C_{1-5})alkyl and R^4 is hydrogen or unsubstituted (C_{1-5})alkyl, then X^2 may not represent (i) a bond when R^1 is $-C(O)R^{20}$, $-C(O)_2R^{20}$ or $-S(O)_2R^{20}$ in which R^{20} is (C_{1-6}) alkyl, phenyl(C_{1-4})alkyl, phenyl, (C_{3-7})cycloalkyl, camphan-10-yl, naphth-1-yl, naphth-2-yl, phenyl substituted by one or more of (C_{1-4})alkyl, perfluoro(C_{1-4})alkyl, (C_{1-4})alkoxy, hydroxy, halo, amido, nitro, amino, (C_{1-4})alkylamino, (C_{1-4}) dialkylamino, carboxy or (C_{1-4})alkoxycarbonyl, or naphth-1-yl or naphth-2-yl substituted by one or more of (C_{1-4})alkyl, perfluoro(C_{1-4})alkyl, (C_{1-4})alkoxy, hydroxy, halo, amido, nitro, amino, carboxy or (C_{1-4})alkoxycarbonyl or (ii) a divalent group of formula (a) or (b) in which the moiety R^{12} is methyl, isopropyl, *n*-butyl, *sec*-butyl, *tert*-butyl, 1-methylpropyl, benzyl, naphth-1-ylmethyl, naphth-2-ylmethyl, thien-2-ylmethyl, thien-3-ylmethyl, or wherein R^9 and R^{12} form ethylene, trimethylene, hydroxy-substituted trimethylene, tetramethylene or phenylene-1,2-dimethylene; or

R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-8})cycloalkylene or (C_{3-8})heterocycloalkylene, wherein said cycloalkylene or heterocycloalkylene is optionally substituted with 1 to 3 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)$ $NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above;

R^4 is hydrogen, (C_{1-6})alkyl or as defined above;

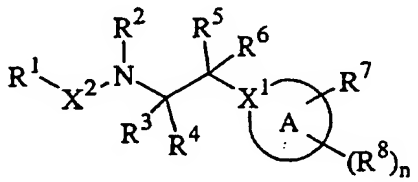
R^5 is hydrogen and R^6 is hydroxy or R^5 and R^6 together form oxo;

R^7 is a group selected from cyano, halo, nitro, $-R^{29}$, $-X^5NR^{29}R^{30}$, $-X^5NR^{30}C(O)OR^{29}$, $-X^5NR^{30}C(O)NR^{29}R^{30}$, $-X^5NR^{30}C(NR^{30})NR^{29}R^{30}$, $-X^5OR^{29}$, $-X^5SR^{29}$, $-X^5C(O)OR^{29}$, $-X^5C(O)NR^{29}R^{30}$, $-X^5S(O)_2NR^{29}R^{30}$, $-X^5P(O)(OR^{30})$ OR^{29}, $-X^5OP(O)(OR^{29})OR^{29}$, $-X^5NR^{30}C(O)R^{31}$, $-X^5S(O)R^{31}$, $-X^5S(O)_2R^{31}$ and $-X^5C(O)R^{31}$, wherein X^5 is as defined above, R^{29} is hydrogen or $-R^{31}$, R^{30} at each occurrence is hydrogen or (C_{1-6})alkyl and R^{31} is (C_{1-6})alkyl, (C_{3-12})cycloalkyl (C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl or hetero(C_{5-12})aryl(C_{0-6})alkyl, wherein within R^7 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C$ $(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P$ $(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; and

R^8 at each occurrence independently is selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C$ $(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; and the *N*-oxide derivatives, prodrug derivatives, protected derivatives, individual isomers and mixtures of isomers; and the pharmaceutically acceptable salts thereof.; but excluding compounds selected from the group consisting of ((*S*)-1-{(*S*)-1-[(*S*)-1-(1-benzooxazol-2-yl-methanoyl)-3-methyl-butylcarbamoyl]-3-methyl-butylcarbamoyl}-3-methyl-butyl)-carbamic acid benzyl ester, {1-[1-(1-1*H*-imidazol-2-yl-methanoyl)-3-methyl-butylcarbamoyl]-3-methyl-butyl}-carbamic acid *tert*-butyl ester, [(S)-3-methyl-1-((S)-3-methyl-1-{(1-[1-(2-trimethylsilanyl-ethoxymethyl)-1*H*-imidazol-2-yl]-methanoyl}-butylcarbamoyl)-butyl]-carbamic acid benzyl ester; {(S)-1-[(S)-1-(1-1*H*-imidazol-2-yl-methanoyl)-3-methyl-butylcarbamoyl]-3-methyl-butyl}-carbamic acid benzyl ester, ((S)-1-{(S)-1-[1-(1-benzyl-1*H*-imidazol-2-yl)-methanoyl]-3-methyl-butylcarbamoyl}-3-methyl-butyl)-carbamic acid benzyl ester, {(S)-1-[(S)-1-(1-1*H*-imidazol-2-yl-methanoyl)-3-methyl-butyl-

carbamoyl]-3-methyl-butyl)-carbamic acid *tert*-butyl ester, 3-{ [1-(4-chloro-phenyl)-methanoyl)-amino) }-4-oxo-4-pyridin-3-yl-butyric acid ethyl ester, 4-furan-2-yl-4-oxo-3-{[1-(4-trifluoromethyl-phenyl)-methanoyl]-amino}-butyric acid ethyl ester, 3-(2-methyl-propanoylamino)-4-oxo-4-thiophen-2-yl-butyric acid ethyl ester, 4-oxo-4-thiophen-2-yl-3-[(1-*p*-tolyl-methanoyl)-amino]-butyric acid ethyl ester, 4-(5-bromo-thiophen-2-yl)-3-{[1-(4-chloro-phenyl)-methanoyl)-amino }-4-oxo-butyric acid ethyl ester, 3-{[1-(4-chloro-phenyl)-methanoyl]-amino}-4-(5-methyl-thiophen-2-yl)-4-oxo-butyric acid ethyl ester, 4-oxo-4-thiophen-3-yl-3-[(1-*p*-tolyl-methanoyl)-amino]-butyric acid ethyl ester, 3-{[1-(4-methoxy-phenyl)-methanoyl]-amino}-4-oxo-4-thiophen-3-yl-butyric acid ethyl ester, 3-{[1-(3,4-dichloro-phenyl)-methanoyl]-amino}-4-oxo-4-thiophen-3-yl-butyric acid ethyl ester, 4-fluoro-*N*-[1-(1-thiophen-3-yl-methanoyl)-propyl]-benzamide, 4-{(1-(4-fluoro-phenyl)-methanoyl]-amino}-5-oxo-5-thiophen-3-yl-pentanoic acid ethyl ester and 3-{[1-(4-fluoro-phenyl)-methanoyl]-amino}-2-methyl-4-oxo-4-thiophen-3-yl-butyric acid ethyl ester.

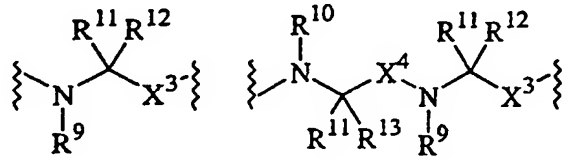
[0008] In another particular embodiment, the present invention relates to protease inhibitors of Formula I:



I

in which:

A comprises a heteromonocyclic ring containing 5 to 6 ring member atoms or a fused heteropolycyclic ring system containing 8 to 14 ring member atoms, wherein each ring contains 5 to 7 ring member atoms, X^1 is a ring member carbon atom and each ring member atom other than X^1 is a carbon atom or a heteroatom, with the proviso that (i) at least one ring member atom is a heteroatom and (ii) when A is a heteromonocyclic radical containing 5 ring member atoms, no more than two of the ring member atoms comprising A are heteroatoms;
n is 0, 1, 2 or 3;
X^1 is =C- or -CH-;
X^2 is a bond or a divalent group of Formula (a) or (b):



(a) (b)

wherein:

X^3 and X^4 independently are -C(O)- or $-CH_2S(O)_2-$;
R^9 and R^{10} independently are hydrogen, (C_{1-6})alkyl or as defined below;
R^{11} at each occurrence independently is hydrogen or $(C_{1-6}$alkyl;
R^{12} and R^{13} independently are (i) (C_{1-6})alkyl optionally substituted with cyano, halo, nitro, $-NR^{14}R^{14}$, $-NR^{14}C(O)OR^{14}$, $-NR^{14}C(O)NR^{14}R^{14}$, $-NR^{14}C(NR^{14})NR^{14}R^{14}$, $-OR^{14}$, $-SR^{14}$, $-C(O)OR^{14}$, $-C(O)^{14}R^{14}$, $-S(O)_2NR^{14}R^{14}$, $-P(O)(OR)^{14})OR^{14}$, $-OP(O)(OR^{14})OR^{14}$, $-NR^{14}C(O)R^{15}$, $-S(O)R^{15}$, $-S(O)_2R^{15}$, $-C(O)R^{15}$, $-OR^{16}$, $-SR^{16}$, $-S(O)R^{16}$, $-S(O)_2R^{16}$, $-C(O)R^{16}$, $-C(O)OR^{16}$, $-OC(O)R^{16}$, $-NR^{16}R^{17}$,$-NR^{17}C(O)R^{16}$, $-NR^{17}C(O)OR^{16}$, $-C(O)NR^{16}R^{17}$, $-S(O)_2NR^{16}R^{17}$, $-NR^{17}C(O)NR^{16}R^{17}$ or $-NR^{17}C(NR^{17})NR^{16}R^{17}$, wherein R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, R^{15} (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, R^{16} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl and R^{17} is hydrogen or (C_{1-6})alkyl, and wherein within R^{16} said cycloalkyl, heterocycloalkyl, aryl, heteroaryl, polycycloaryl or heterpolycycloaryl ring optionally is

substituted by a group selected from -R^{18}, -X^5OR^{18}, -X^5SR^{18}, -$X^5S(O)R^{18}$, -$X^5S(O)_2R^{18}$, -$X^5C(O)R^{18}$, -$X^5C(O)OR^{18}$, -$X^5OC(O)R^{18}$, -$X^5NR^{18}R^{19}$, -$X^5NR^{19}C(O)R^{18}$, -$X^5NR^{19}C(O)OR^{18}$, -$X^5C(O)NR^{18}R^{19}$, -$X^5S(O)_2NR^{18}R^{19}$, -$X^5NR^{19}C(O)^{18}R^{19}$ or -$X^5NR^{19}C(NR^{19})NR^{18}R^{19}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{18} is hydrogen or (C_{1-6})alkyl and R^{19} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl, or (ii) a group selected from (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl and hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl, wherein said cycloalkyl, heterocycloalkyl, aryl, heteroaryl, polycycloaryl or heterpolycycloaryl ring optionally is substituted by a group selected from -R^{18}, -X^5OR^{18}, -X^5SR^{18}, -$X^5S(O)R^{18}$, -$X^5S(O)_2R^{18}$, -$X^5C(O)R^{18}$, -$X^5C(O)OR^{18}$, -$X^5OC(O)R^{18}$, -$X^5NR^{18}R^{19}$, -$X^5NR^{19}C(O)R^{18}$, -$X^5NR^{19}C(O)OR^{18}$, -$X^5C(O)NR^{18}R^{19}$, -$X^5S(O)_2NR^{18}R^{19}$, -$X^5NR^{19}C(O)NR^{18}R^{19}$ or -$X^5NR^{19}C(NR^{19})NR^{18}R^{19}$, wherein X^5, R^{18} and R^{19} are as defined above; wherein within R^{12} and/or R^{13} any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, -$X^5NR^{14}R^{14}$, -$X^5NR^{14}C(O)OR^{14}$, -$X^5NR^{14}C(O)NR^{14}R^{14}$, -$X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, -$X^5OR^{14}$, -$X^5SR^{14}$, -$X^5C(O)OR^{14}$, -$X^5C(O)NR^{14}R^{14}$, -$X^5S(O)_2NR^{14}R^{14}$, -$X^5P(O)(OR^{14})OR^{14}$, -$X^5OP(O)(OR^{14})OR^{14}$, -$X^5NR^{14}C(O)R^{15}$, -$X^5S(O)R^{15}$, -$X^5S(O)_2R^{15}$ and -$X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; or

R^{12} together with R^9 and/or R^{13} together with R^{10} form trimethylene, tetramethylene or phenylene-1,2-dimethylene,, optionally substituted with 1 to 3 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, oxo, -$X^5NR^{14}C(O)OR^{14}$, -$X^5NR^{14}C(O)NR^{14}R^{14}$, -$X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, -$X^5OR^{14}$, -$X^5SR^{14}$, -$X^5C(O)OR^{14}$, -$X^5C(O)NR^{14}R^{14}$, -$X^5S(O)_2NR^{14}R^{14}$, -$X^5P(O)(OR^{14})OR^{14}$, -$X^5OP(O)(OR^{14})OR^{14}$, -$X^5NR^{14}C(O)R^{15}$, -$X^5S(O)R^{15}$, -$X^5S(O)_2R^{15}$ and -$X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; and

R^1 is -$X^6X^7R^{20}$, wherein X^6 is -C(O)-, -C(O)C(O)- or -$S(O)_2$-, X^7 is a bond, -O- or -NR^{21}-, wherein R^{21} is hydrogen or (C_{1-6})alkyl, and R^{20} is (i) (C_{1-6})alkyl optionally substituted by cyano, halo, nitro, -$NR^{14}R^{14}$, -$NR^{14}C(O)OR^{14}$, -$NR^{14}C(O)NR^{14}R^{14}$, -$NR^{14}C(NR^{14})NR^{14}R^{14}$, -$OR^{14}$, -$SR^{14}$, -$C(O)OR^{14}$, -$C(O)NR^{14}R^{14}$, -$S(O)_2NR^{14}R^{14}$, -$P(O)(OR^{14})OR^{14}$, -$OP(O)(OR^{14})OR^{14}$, -$NR^{14}C(O)R^{15}$, -$S(O)R^{15}$, -$S(O)_2R^{15}$, -$C(O)R^{15}$, -$OR^{22}$, -$SR^{22}$, -$S(O)R^{22}$, -$S(O)_2R^{22}$, -$C(O)R^{22}$, -$C(O)OR^{22}$, -$C(O)NR^{22}R^{23}$, -$NR^{22}R^{23}$, -$NR^{23}C(O)R^{22}$, -$NR^{23}C(O)OR^{22}$, -$NR^{23}C(O)NR^{22}R^{23}$ or -$NR^{23}C(NR^{23})NR^{22}R^{23}$, wherein R^{14} and R^{15} are as defined above, R^{22} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})bicycloaryl(C_{0-6})alkyl or hetero(C_{8-12})bicycloaryl(C_{0-6})alkyl and R^{23} at each occurrence independently is hydrogen or (C_{1-6})alkyl, or (ii) (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, diphenyl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, dihetero(C_{5-6})aryl(C_{0-6})alkyl, (C_{9-12})bicycloaryl(C_{0-6})alkyl or hetero(C_{8-12})bicycloaryl(C_{0-6})alkyl wherein said cycloalkyl, heterocycloalkyl, aryl or heteroaryl may be substituted by -R^{24}, -X^5OR^{24}, -X^5SR^{24}, -$X^5S(O)R^{24}$, -$X^5S(O)_2R^{24}$, -$X^5C(O)R^{24}$, -X^5 $C(O)OR^{24}$, -$X^5C(O)NR^{24}R^{24}$ -$X^5NR^{24}R^{25}$ -$X^5NR^{25}C(O)R^{24}$, -$X^5NR^{25}C(O)OR^{24}$, -$X^5NR^{25}C(O)NR^{24}R^{25}$ or -$X^5NR^{25}C(NR^{25})NR^{25}R^{25}$, wherein X^5 is as defined above, R^{24} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})bicycloaryl(C_{0-6})alkyl or hetero(C_{8-12})bicycloaryl(C_{0-6})alkyl and R^{25} at each occurrence independently is hydrogen or (C_{1-6})alkyl; wherein within R^1 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, -$X^5NR^{14}R^{14}$, -$X^5NR^{14}C(O)OR^{14}$, -$X^5NR^{14}C(O)NR^{14}R^{14}$, -$X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, -$X^5OR^{14}$, -$X^5SR^{14}$, -$X^5$ $C(O)OR^{14}$, -$X^5C(O)NR^{14}R^{14}$, -$X^5S(O)_2NR^{14}R^{14}$, -$X^5P(O)(OR^{14})OR^{14}$, -$X^5OP(O)(OR^{14})OR^{14}$, -$X^5NR^{14}C(O)R^{15}$, -$X^5S(O)R^{15}$ -$X^5S(O)_2R^{15}$ and -$X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; or when X^2 is a divalent group of formula (a) or (b) then R^1 may also represent hydrogen, carboxy, oxalo or carbamoyl;

R^2 is hydrogen or (C_{1-6})alkyl;

R^3 is (i) (C_{1-6})alkyl optionally substituted with cyano, halo, nitro, -SR^{24}, -$C(O)OR^{24}$, -$C(O)NR^{24}R^{24}$, -$P(O)(OR^{24})OR^{24}$, -$OP(O)(OR^{24})OR^{24}$, -$S(O)R^{25}$, -$S(O)_2R^{25}$ or -$C(O)R^{25}$, wherein R^{24} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{25} (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, or (ii) (C_{5-6})cycloalkyl(C_{2-3})alkyl, hetero(C_{3-6})cycloalkyl(C_{2-3})alkyl, (C_{6-12})aryl(C_{2-3})alkyl or hetero(C_{5-6})aryl(C_{2-3})alkyl, wherein said cycloalkyl, heterocycloalkyl, aryl or heteroaryl optionally is substituted further with 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, -$X^5NR^{14}C(O)OR^{14}$, -$X^5NR^{14}C(O)NR^{14}R^{14}$, -$X^5NR^{14}C(NR^{14})NR^{14}R^{14}$ -X^5OR^{14}, -X^5SR^{14}, -$X^5C(O)OR^{14}$, -$X^5C(O)NR^{14}R^{14}$, -$X^5S(O)_2NR^{14}$ R^{14}, -$X^5P(O)(OR^{14})OR^{14}$, -$X^5OP(O)(OR^{14})OR^{14}$, -$X^5NR^{14}C(O)R^{14}$, -$X^5S(O)R^{15}$, -$X^5S(O)_2R^{15}$ and -$X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above, provided that when R^3 is unsubstituted (C_{1-5})alkyl and R^4 is hydrogen or unsubstituted (C_{1-5})alkyl, then X^2 may not represent (i) a bond when R^1 is -$C(O)R^{20}$, -$C(O)_2R^{20}$ or -$S(O)_2R^{20}$ in which R^{20} is (C_{1-6})alkyl, phenyl(C_{1-4})alkyl, phenyl, (C_{3-7})cycloalkyl, camphan-10-yl, naphth-1-yl, naphth-2-yl, phenyl substituted by one or more of (C_{1-4})alkyl, perfluoro(C_{1-4})alkyl, (C_{1-4})alkoxy, hydroxy, halo, amido, nitro, amino, (C_{1-4})alkylamino, (C_{1-4})dialkylamino, carboxy or (C_{1-4})alkoxycarbonyl, or naphth-1-yl or naphth-2-yl

substituted by one or more of (C_{1-4})alkyl, perfluoro(C_{1-4})alkyl, (C_{1-4})alkoxy, hydroxy, halo, amido, nitro, amino, carboxy or (C_{1-4})alkoxycarbonyl or (ii) a divalent group of formula (a) or (b) in which the moiety R^{12} is methyl, isopropyl, n-butyl, *sec*-butyl, *tert*-butyl, 1-methylpropyl, benzyl, naphth-1-ylmethyl, naphth-2-ylmethyl, thien-2-ylmethyl, thien-3-ylmethyl, or wherein R^9 and R^{12} form ethylene, trimethylene, hydroxy-substituted trimethylene, tetramethylene or phenylene-1,2-dimethylene; or

R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-8})cycloalkylene or (C_{3-8})heterocycloalkylene, wherein said cycloalkylene or heterocycloalkylene is optionally substituted with 1 to 3 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above;

R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-8})cycloalkylene or (C_{3-8})heterocycloalkylene, wherein said cycloalkylene or heterocycloalkylene is optionally substituted with 1 to 3 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above;

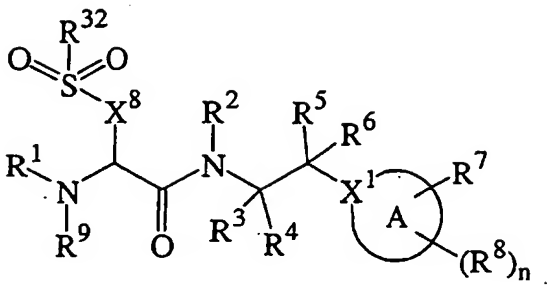
R^4 is hydrogen, (C_{1-6})alkyl or as defined above;

R^5 is hydrogen and R^6 is hydroxy or R^5 and R^6 together form oxo;

R^7 is a group selected from cyano, halo, nitro, $-R^{29}$, $-X^5NR^{29}R^{30}$, $-X^5NR^{30}C(O)OR^{29}$, $-X^5NR^{30}C(O)NR^{29}R^{30}$, $-X^5NR^{30}C(NR^{30})NR^{29}R^{30}$, $-X^5OR^{29}$, $-X^5SR^{29}$, $-X^5C(O)OR^{29}$, $-X^5C(O)NR^{29}R^{30}$, $-X^5S(O)_2NR^{29}R^{30}$, $-X^5P(O)(OR^{30})OR^{29}$, $-X^5OP(O)(OR^{29})OR^{29}$, $-X^5NR^{30}C(O)R^{20}$, $-X^5S(O)R^{20}$, $-X^5S(O)_2R^{20}$, $-X^5C(O)R^{20}$ and $-C(O)NR^{42}CHR^{43}C(O)OR^{29}$, wherein X^5 and R^{20} are as defined as above, R^{29} is hydrogen or $-R^{20}$, wherein R^{20} is defined as above, R^{30} at each occurrence is hydrogen or (C_{1-6})alkyl, R^{42} is hydrogen, (C_{1-6})alkyl or together with R^{43} forms trimethylene, tetramethylene or phenylene-1,2-dimethylene, optionally substituted with hydroxy or oxo, and R^{43} is as defined above or is (i) (C_{1-6})alkyl optionally substituted with cyano, halo, nitro, $-NR^{14}R^{14}$, $-NR^{14}C(O)OR^{14}$, $-NR^{14}C(O)NR^{14}R^{14}$, $-NR^{14}C(NR^{14})NR^{14}R^{14}$, $-OR^{14}$, $-SR^{14}$, $-C(O)OR^{14}$, $-C(O)NR^{14}R^{14}$, $-S(O)_2NR^{14}R^{14}$, $-P(O)(OR^{14})OR^{14}$, $-OP(O)(OR^{14})OR^{14}$, $-NR^{14}C(O)R^{15}$, $-S(O)R^{15}$, $-S(O)_2R^{15}$, $-C(O)R^{15}$, $-OR^{16}$, $-SR^{16}$, $-S(O)R^{16}$, $-S(O)_2R^{16}$, $-C(O)R^{16}$, $-C(O)OR^{16}$, $-OC(O)R^{16}$, $-NR^{16}R^{17}$, $-NR^{17}C(O)R^{16}$, $-NR^{17}C(O)OR^{16}$, $-C(O)NR^{16}R^{17}$, $-S(O)_2NR^{16}R^{17}$, $-NR^{17}C(O)NR^{16}R^{17}$ or $-NR^{17}C(NR^{17})NR^{16}R^{17}$ or (ii) a group selected from (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl and hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl, wherein said cycloalkyl, heterocycloalkyl, aryl, heteroaryl, polycycloaryl or heterpolycycloaryl ring optionally is substituted by a group selected from $-R^{18}$, $-X^5OR^{18}$, $-X^5SR^{18}$, $-X^5S(O)R^{18}$, $-X^5S(O)_2R^{18}$, $-X^5C(O)R^{18}$, $-X^5C(O)OR^{18}$, $-X^5OC(O)R^{18}$, $-X^5NR^{18}R^{19}$, $-X^5NR^{19}C(O)R^{18}$, $-X^5NR^{19}C(O)OR^{18}$, $-X^5C(O)NR^{18}R^{19}$, $-X^5S(O)_2NR^{18}R^{19}$, $-X^5NR^{19}C(O)NR^{18}R^{19}$ or $-X^5NR^{19}C(NR^{19})NR^{18}R^{19}$, wherein X^5, R^{14}, R^{15}, R^{16}, R^{17}, R^{18} and R^{19} are as defined above; wherein within R^7 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; and

R^8 at each occurrence independently is selected from (C_{1-6})alkyl, halo-substituted (C_{1-4})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl; and the *N*-oxide derivatives, prodrug derivatives, protected derivatives, individual isomers and mixtures of isomers; and the pharmaceutically acceptable salts thereof.

[0009] In another particular embodiment, the present invention relates to a compound of Formula II:



II

in which:

A comprises a heteromonocyclic ring containing 5 to 6 ring member atoms or a fused heteropolycyclic ring system containing 8 to 14 ring member atoms, wherein each ring contains 5 to 7 ring member atoms, X^1 is a ring member carbon atom and each ring member atom other than X^1 is a carbon atom or a heteroatom, with the proviso that at least one ring member atom is a heteroatom;

n is 0, 1, 2 or 3;

X^1 is =C- or -CH-;

X^8 is (C_{1-2})alkylene;

R^1 is hydrogen, carboxy, oxalo, carbamoyl or $-X^6X^7R^{20}$, wherein X^6 is -C(O)-, -C(O)C(O)- or $-S(O)_2-$, X^7 is a bond, -O- or $-NR^{21}-$, wherein R^{21} is hydrogen or (C_{1-6})alkyl, and R^{20} is (i) (C_{1-6})alkyl optionally substituted by cyano, halo, nitro, $-NR^{14}R^{14}$, $-NR^{14}C(O)OR^{14}$, $-NR^{14}C(O)NR^{14}R^{14}$, $-NR^{14}C(NR^{14})NR^{14}R^{14}$ $-OR^{14}$, $-SR^{14}$, $-C(O)OR^{14}$ $-C(O)NR^{14}R^{14}$, $-S(O)_2NR^{14}R^{14}$, $-P(O)(OR^{14})OR^{14}$, $-OP(O)(OR^{14})OR^{14}$, $-NR^{14}C(O)R^{15}$ $-S(O)R^{15}$, $-S(O)_2R^{15}$, $-C(O)R^{15}$, $-OR^{22}$, $-SR^{22}$, $-S(O)R^{22}$,$-S(O)_2R^{22}$, $-C(O)R^{22}$, $-C(O)OR^{22}$, $-C(O)NR^{22}R^{23}$, $-NR^{22}R^{23}$, $-NR^{23}C(O)R^{22}$, $-NR^{23}C(O)OR^{22}$,$-NR^{23}C(O)NR^{22}R^{23}$ or $-NR^{23}C(NR^{23})NR^{22}R^{23}$, wherein R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, R^{15} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, R^{22} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl,(C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})bicycloaryl(C_{0-6})alkyl or hetero(C_{8-12})bicycloaryl(C_{0-6})alkyl and R^{23} at each occurrence independently is hydrogen or (C_{1-6})alkyl, or (ii) (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})bicycloaryl(C_{0-6})alkyl or hetero(C_{8-12})bicycloaryl(C_{0-6})alkyl or (iii) (C_{3-6})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6})alkyl or hetero(C_{5-6})aryl(C_{0-6})alkyl substituted by $-X^5OR^{24}$, $-X^5SR^{24}$, $-X^5S(O)R^{24}$, $-X^5S(O)_2R^{24}$, $-X^5C(O)R^{24}$, $-X^5C(O)OR^{24}$, $-X^5C(O)NR^{24}R^{25}$, $-X^5NR^{24}R^{25}$, $-X^5NR^{25}C(O)R^{24}$, $-X^5NR^{25}C(O)OR^{24}$, $-X^5NR^{25}C(O)NR^{24}R^{25}$ or $-X^5NR^{25}C(NR^{25})NR^{24}R^{25}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{24} is (C_{3-6})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6})alkyl or hetero(C_{5-6})aryl(C_{0-6})alkyl and R^{25} at each occurrence independently is hydrogen or (C_{1-6})alkyl; wherein within R^1 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{10}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR)^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above;

R^2 is hydrogen or (C_{1-6})alkyl;

R^3 is (i) (C_{1-6})alkyl optionally substituted with cyano, halo, nitro, $-NR^{14}R^{14}$, $-NR^{14}C(O)OR^{14}$, $-NR^{14}C(O)NR^{14}R^{14}$, $-NR^{14}C(NR^{14})NR^{14}R^{14}$, $-OR^{14}$, $-SR^{14}$, $-C(O)OR^{14}$, $-C(O)NR^{14}R^{14}$, $-S(O)_2NR^{14}R^{14}$, $-P(O)(OR^{14})OR^{14}$, $-OP(O)(OR^{14})OR^{14}$, $-NR^{14}C(O)R^{15}$, $-S(O)R^{15}$, $-S(O)_2R^{15}$, $-C(O)R^{15}$, $-OR^{16}$, $-SR^{16}$, $-S(O)R^{16}$, $-S(O)_2R^{16}$, $-C(O)R^{16}$, $-C(O)OR^{16}$, $-OC(O)R^{16}$, $-NR^{16}R^{17}$, $-NR^{17}C(O)R^{16}$, $-NR^{17}C(O)OR^{16}$, $-C(O)NR^{16}R^{17}$, $-S(O)_2NR^{16}R^{17}$, $-NR^{17}C(O)NR^{16}R^{17}$ or $-NR^{17}C(NR^{17})NR^{16}R^{16}$, wherein R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, R^{15} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, R^{16} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl and R^{17} is hydrogen or (C_{1-6})alkyl, and wherein within R^{16} said cycloalkyl, heterocycloalkyl, aryl, heteroaryl, polycycloaryl or heterpolycycloaryl ring optionally is substituted by a group selected from $-R^{18}$, $-X^5OR^{18}$, $-X^5SR^{18}$, $-X^5S(O)R^{18}$, $-X^5S(O)_2R^{18}$, $-X^5C(O)R^{18}$, $-X^5C(O)OR^{18}$, $-X^5OC(O)R^{18}$, $-X^5NR^{18}R^{19}$, $-X^5NR^{19}C(O)R^{18}$, $-X^5NR^{19}C(O)OR^{18}$, $-X^5C(O)NR^{18}R^{19}$, $-X^5S(O)_2NR^{18}R^{19}$, $-X^5NR^{19}C(O)NR^{18}R^{19}$ or $-X^5NR^{19}C(NR^{19})NR^{18}R^{19}$, wherein X^5 is as defined above, R^{18} is hydrogen or (C_{1-6})alkyl and R^{19} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl,

(C_{9-12})polycycloaryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl, or (ii) a group selected from (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl and hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl, wherein said cycloalkyl, heterocycloalkyl, aryl, heteroaryl, polycycloaryl or heterpolycycloaryl ring optionally is substituted by a group selected from $-R^{18}$, $-X^5OR^{18}$, $-X^5SR^{18}$, $-X^5S(O)R^{18}$, $-X^5S(O)_2R^{18}$, $-X^5C(O)R^{18}$, $-X^5C(O)OR^{18}$, $-X^5OC(O)R^{18}$, $-X^5NR^{18}R^{19}$, $-X^5NR^{19}C(O)R^{18}$, $-X^5NR^{19}C(O)OR^{18}$, $-X^5C(O)NR^{18}R^{19}$, $-X^5S(O)_2NR^{18}R^{19}$, $-X^5NR^{19}C(O)NR^{18}R^{19}$ or $-X^5NR^{19}C(NR^{19})NR^{18}R^{19}$, wherein X^5, R^{18} and R^{19} are as defined above; wherein within R^{12} and/or R^{13} any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above, or

R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-8})cycloalkylene or (C_{3-8})heterocycloalkylene, wherein said cycloalkylene or heterocycloalkylene is optionally substituted with 1 to 3 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above;

R^4 is hydrogen, (C_{1-6})alkyl or as defined above;

R^5 is hydrogen and R^6 is hydroxy or R^5 and R^6 together form oxo;

R^7 is a group selected from cyano, halo, nitro, $-R^{29}$, $-X^5NR^{29}R^{30}$, $-X^5NR^{30}C(O)OR^{29}$, $-X^5NR^{30}C(O)NR^{29}R^{30}$, $-X^5NR^{30}C(NR^{30})NR^{29}R^{30}$, $-X^5OR^{29}$, $-X^5SR^{29}$, $-X^5C(O)OR^{29}$, $-X^5C(O)NR^{29}R^{30}$, $-X^5S(O)_2NR^{29}R^{30}$, $-X^5P(O)(OR^{30})OR^{29}$, $-X^5OP(O)(OR^{29})OR^{29}$, $-X^5NR^{30}C(O)R^{31}$, $-X^5S(O)R^{31}$, $-X^5S(O)_2R^{31}$ and $-X^5C(O)R^{31}$, wherein X^5 is as defined above, R^{29} is hydrogen or $-R^{31}$, R^{30} at each occurrence is hydrogen or (C_{1-6})alkyl and R^{31} is (C_{1-6})alkyl, (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl or hetero(C_{5-12})aryl(C_{0-6})alkyl, wherein within R^7 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR)^{14})NR^{14}R^{14}$; $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$ $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; and

R^8 at each occurrence independently is selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$,$-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above;

R^9 is hydrogen or (C_{1-6})alkyl; and

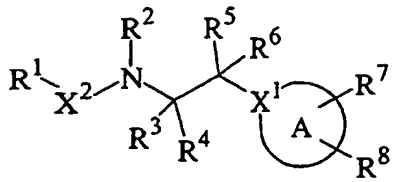
R^{32} is (C_{1-8})alkyl, (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alhyl, hetero (C_{5-12})aryl(C_{0-12})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl, wherein within R^{30} any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR)^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; and the *N*-oxide derivatives, prodrug derivatives, protected derivatives, individual isomers and mixtures of isomers; and the pharmaceutically acceptable salts thereof.

[0010] In another particular embodiment, the present invention relates to a pharmaceutical composition which contains a compound of Formula I or II, or a *N*-oxide derivative, prodrug derivative, individual isomer or mixture of isomers, or a pharmaceutically acceptable salt thereof in admixture with one or more suitable excipients.

[0011] In another particular embodiment, the present invention relates to method of treating a disease in an animal in which inhibition of a cysteine protease can prevent, inhibit or ameliorate the pathology and/or symptomatology of the disease, which method comprises administering to the animal a therapeutically effective amount of compound of Formula I or II or a *N*-oxide derivative, prodrug derivative, individual isomer or mixture of isomers or a pharmaceutically acceptable salt thereof.

[0012] In another particular embodiment, the present invention relates to processes for preparing compounds of Formula I and II and the *N*-oxide derivatives, prodrug derivative, protected derivatives, individual isomers and mixtures of isomers, and the pharmaceutically acceptable salts thereof as set forth in "Detailed Description of the Invention".

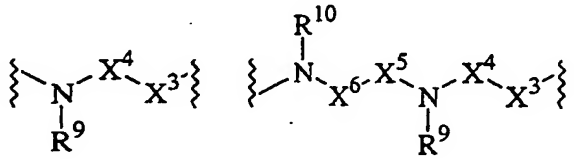
[0013] In another particular embodiment, the present invention relates to protease inhibitors of Formula III:



III

in which:

A comprises a heteromonocyclic radical containing 5 to 6 annular atoms or a fused heteropolycyclic radical containing 8 to 14 annular atoms, wherein each ring contains 5 to 7 annular atoms, X^1 is an annular carbon atom and each annular atom other than X^1 optionally is a heteroatom, with the proviso that when A is a heteromonocyclic radical containing 5 annular atoms, no more than two of the annular atoms comprising the ring are heteroatoms;
X^1 is selected from =C- and -CH-;
X^2 is a bond or a divalent group of Formula (a) or (b):



(a) (b)

wherein:
X^3 and X^5 independently are -C(O)- or -$S(O)_2$-,
X^4 is -CHR^{11}-, -CH_2CHR^{11}- or -$CHR^{11}CH_2$- and X^6 is -CHR^{12}-, -CH_2CHR^{12}- or -$CHR^{12}CH_2$- wherein:

R^{11} and R^{12} are independently (i) (C_{1-6})alkyl or halo-substituted(C_{1-6})alkyl optionally substituted with -OR^{13}, -SR^{13}, -S(O)R^{13}, -$S(O)_2R^{13}$, -C(O)R^{13}, -C(O)OR^{13}, -$NR^{13}R^{14}$, -$NR^{14}C(O)OR^{13}$, -C(O)$NR^{13}R^{14}$, -$S(O)_2NR^{13}R^{14}$,-$NR^{14}C(O)NR^{13}R^{14}$ or -$NR^{14}C(NR^{14})NR^{13}R^{14}$, wherein R^{13} is hydrogen, (C_{1-6})alkyl, (C_{3-12})cycloalkyl(C_{0-3})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-3})alkyl, (C_{6-12})aryl(C_{0-3})alkyl or hetero(C_{5-12})aryl(C_{0-3})alkyl and R^{14} is hydrogen or (C_{1-6})alkyl, or (ii) (C_{3-12})cycloalkyl(C_{0-3})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-3})alkyl, (C_{6-12})aryl(C_{0-3})alkyl, hetero(C_{5-12})aryl(C_{0-3})alkyl, (C_{9-12})polycycloaryl(C_{0-3})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-3})alkyl optionally substituted with -R^{15}, -X^7OR^{15}, -X^7SR^{15}, -S(O)R^{15} -$S(O)_2R^{15}$, -C(O)R^{15}, -C(O)OR^{15}, -$X^7NR^{15}R^{16}$, -$X^7NR^{16}C(O)OR^{15}$, -C(O)$NR^{15}R^{16}$, -$S(O)_2NR^{15}R^{16}$, -$NR^{16}C(O)NR^{15}R^{16}$ or -$NR^{16}C(NR^{16})NR^{15}R^{16}$, wherein X^7 is a bond or methylene, R^{15} is (C_{3-12})cycloalkyl(C_{0-3})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-3})alkyl, (C_{6-12})aryl(C_{0-3})alkyl, hetero(C_{5-12})aryl(C_{0-3})alkyl, (C_{9-12})polycycloaryl(C_{0-3})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-3})alkyl and R^{16} is hydrogen or (C_{1-6})alkyl, or (iii) together with R^9 or R^{10}, respectively, when X^4 is -CHR^{11}- and/or X^6 is -CHR^{12}-, forms trimethylene, tetramethylene or phenylene-1,2-dimethylene, optionally substituted with hydroxy or oxo; wherein any 1 to 3 annular atoms of any aromatic ring with available valences comprising R^{11} and/or R^{12} are optionally independently substituted with halo, nitro, cyano, (C_{1-6})alkyl, halo-substituted(C_{1-6})alkyl, -OR^{17}, -C(O)R^{17}, -C(O)OR^{17}, -C(O)$NR^{17}R^{17}$, -$S(O)_2NR^{17}R^{17}$, -$X^7NR^{17}R^{17}$, -$X^7NR^{17}C(O)OR^{17}$, -$X^7NR^{17}C(O)NR^{17}R^{17}$ or -$X^7NR^{17}C(NR^{17})NR^{17}R^{17}$, wherein X^7 is as defined above and each R^{17} independently is hydrogen or (C_{1-6})alkyl; and
R^9 and R^{10} are independently hydrogen, (C_{1-6})alkyl or as defined above;

R^1 is hydrogen or -$X^8X^9R^{18}$, wherein X^8 is -C(O)- or -$S(O)_2$, X^9 is a bond, -O- or -NR^{19}-, wherein R^{19} is hydrogen or (C_{1-6})alkyl, and R^{18} is (i) (C_{1-6})alkyl or halo-substituted(C_{1-6})alkyl optionally substituted with -OR^{13}, -SR^{13}, -S(O)R^{13}, -$S(O)_2R^{13}$, -C(O)R^{13}, -C(O)OR^{13}, -$NR^{13}R^{14}$, -$NR^{14}C(O)OR^{13}$, -C(O)$NR^{13}R^{14}$, -$S(O)_2NR^{13}R^{14}$, -$NR^{14}C(O)NR^{13}R^{14}$ or -$NR^{14}C(NR^{14})NR^{13}R^{14}$, wherein R^{13} and R^{14} are as defined above, or (ii) (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, diphenyl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, di-

hetero(C_{5-6})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl optionally substituted with $-R^{15}$, $-X^7OR^{15}$, $-X^7SR^{15}$, $-S(O)R^{15}$, $-S(O)_2R^{15}$, $-C(O)R^{15}$, $-C(O)OR^{15}$, $-X^7NR^{15}R^{16}$, $-X^7NR^{16}C(O)OR^{15}$, $-C(O)NR^{15}R^{16}$, $-S(O)_2NR^{15}R^{16}$, $NR^{16}C(O)NR^{15}R^{16}$ or $-NR^{16}C(NR^{16})NR^{15}R^{16}$, wherein X^7, R^{15} and R^{16} are as defined above; wherein any 1 to 3 annular atoms of any aromatic ring with available valences comprising R^1 optionally independently are substituted with halo, nitro, cyano, (C_{1-6})alkyl, halo-substituted(C_{1-6})alkyl, $-OR^{17}$, $-C(O)R^{17}$, $-C(O)OR^{17}$, $-C(O)NR^{17}R^{17}$, $-S(O)_2NR^{17}R^{17}$, $-X^7NR^{17}R^{17}$, $-X^7NR^{17}C(O)OR^{17}$, $-X^7NR^{17}C(O)NR^{17}R^{17}$ or $-X^7NR^{17}(NR^{17})NR^{17}R^{17}$, wherein X^7 and R^{17} are as defined above;

R^2 is hydrogen or (C_{1-6})alkyl;

R^3 is phenyl(C_{2-3})alkyl, hetero(C_{5-6})aryl(C_{2-3})alkyl, (C_{5-6})cycloalkyl(C_{2-3})alkyl or hetero(C_{5-6})cycloalkyl(C_{2-3})alkyl, wherein any 1 to 3 annular atoms of any aromatic ring with available valences comprising R^3 optionally independently are substituted with halo, nitro, cyano, (C_{1-6})alkyl, halo-substituted(C_{1-6})alkyl, $-OR^{17}$, $-C(O)R^{17}$, $-C(O)OR^{17}$, $-C(O)NR^{17}R^{17}$, $-S(O)_2NR^{17}R^{17}$, $-X^7NR^{17}R^{17}$, $-X^7NR^{17}C(O)OR^{17}$, $-X^7NR^{17}C(O)NR^{17}R^{17}$ or $-X^7NR^{17}C(NR^{17})NR^{17}R^{17}$, wherein X^7 and R^{17} are as defined above, and R^4 is hydrogen or R^3 and R^4 are both methyl, ethyl or propyl or together with the carbon atom to which both R^3 and R^4 are attached form cyclopropylene, cyclobutylene or cyclopentylene;

R^5 is hydrogen and R^6 is hydroxy or R^5 and R^6 together form oxo;

R^7 is halo, nitro, $-R^{20}$, $-OR^{20}$, $-C(O)R^{20}$, $-C(O)OR^{20}$, $-S(O)_2NR^{20}R^{21}$, $-C(O)NR^{20}R^{21}$ or $-C(O)NR^{22}CHR^{23}C(O)OR^{20}$ and bonded to any annular carbon atom with a free valence comprising A, wherein:

R^{20} is hydrogen or R^{18}, wherein R^{18} is as defined above;

R^{21} is hydrogen or (C_{1-6})alkyl;

R^{22} is hydrogen, (C_{1-6})alkyl or together with R^{23} forms trimethylene or phenylene-1,2-dimethylene, optionally substituted with hydroxy or oxo; and

R^{23} is as defined above or is (i) (C_{1-6})alkyl or halo-substituted(C_{1-6})alkyl optionally substituted with $-OR^{13}$, $-SR^{13}$, $-S(O)R^{13}$, $-S(O)_2R^{13}$, $-C(O)R^{13}$,$-C(O)OR^{13}$, $-NR^{13}R^{14}$, $-NR^{14}C(O)OR^{13}$, $-C(O)NR^{13}R^{14}$, $-S(O)_2NR^{13}R^{14}$, $-NR^{14}C(O)NR^{13}R^{14}$ or $-NR^{14}C(NR^{14})NR^{13}R^{14}$, wherein R^{13} and R^{14} are as defined above, or (ii) (C_{3-10})cycloalkyl(C_{0-3})alkyl, hetero(C_{3-10})cycloalkyl(C_{0-3})alkyl, (C_{6-12})aryl(C_{0-3})alkyl, hetero(C_{5-12})aryl(C_{0-3})alkyl, (C_{9-12})polycycloaryl(C_{0-3})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-3})alkyl optionally substituted with $-R^{15}$, $-X^7OR^{15}$, $-X^7SR^{15}$, allylidene ($CHCHCH_2$), and the like).

[0014] "Amino" means the radical $-NH_2$. Unless indicated otherwise, the compounds of the invention containing amino moieties include protected derivatives thereof. Suitable protecting groups for amino moieties include acetyl, *tert*-butoxycarbonyl, benzyloxycarbonyl, and the like.

[0015] "Animal" includes humans, non-human mammals (e.g. dogs, cats, rabbits, cattle, horses, sheep, goats, swine, deer, or the like) and non-mammals (e.g. birds, or the like).

[0016] "Aryl" means a monocyclic or bicyclic ring assembly (fused or linked by a single bond) containing the total number of ring carbon atoms indicated, wherein each ring is comprised of 6 ring carbon atoms and is aromatic or when fused with a second ring forms an aromatic ring assembly. For example, (C_{6-12})aryl as used in this Application to define R^1 includes phenyl, naphthyl and biphenylyl.

[0017] "Aromatic" means a moiety wherein the constituent atoms make up an unsaturated ring system, all atoms in the ring system are sp2 hybridized and the total number of pi electrons is equal to 4n + 2.

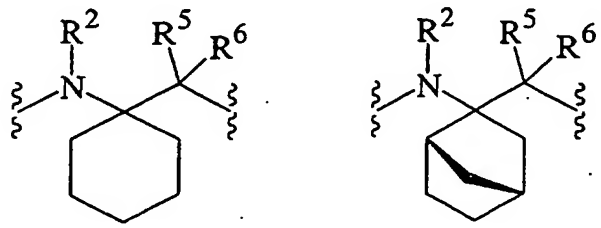
[0018] "Carbamoyl" means the radical $-C(O)NH_2$. Unless indicated otherwise, the compounds of the invention containing carbamoyl moieties include protected derivatives thereof. Suitable protecting groups for carbamoyl moieties include acetyl, *tert*-butoxycarbonyl, benzyloxycarbonyl, and the like and both the unprotected and protected derivatives fall within the scope of the invention.

[0019] "Carboxy" means the radical -C(O)OH. Unless indicated otherwise, the compounds of the invention containing carboxy moieties include protected derivatives thereof. Suitable protecting groups for carboxy moieties include benzyl, *tert*-butyl, and the like. For example, a compound of Formula I wherein R^7 contains a carboxy moiety may exist as either the unprotected or a protected derivative, e.g. wherein R^7 is methoxycarbonyl, and both the unprotected and protected derivatives fall within the scope of the invention.

[0020] "Cycloalkyl" means a saturated or partially unsaturated, monocyclic ring, bicyclic ring assembly (directly linked by a single bond or fused) or bridged polycyclic ring assembly containing the number of ring member carbon atoms indicated, and any carbocyclic ketone, thioketone or iminoketone derivative thereof (e.g. (C_{3-12})cycloalkyl includes cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclohexenyl, 2,5-cyclohexadienyl, bicyclohexylyl, cyclopentylcyclohexyl, bicyclo[2.2.2]octyl, adamantan-1-yl, decahydronaphthalenyl, oxocyclohexyl, dioxocyclohexyl, thiocyclohexyl, 2-oxobicyclo[2.2.1]hept-1-yl, and the like).

[0021] "Cycloalkylene" means a saturated or partially unsaturated, monocyclic ring or bridged polycyclic ring assembly containing the number of annular carbon atoms indicated, and any carbocyclic ketone, thioketone or iminoketone

derivative thereof. For example, the instance wherein R^3 and R^4 together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-8})cycloalkylene" includes, but is not limited to, the following:



in which R^2, R^5 and R^6 are as defined in the Summary of the Invention, and any substituted derivative thereof.

[0022] "Disease" specifically includes any unhealthy condition of an animal or part thereof and includes an unhealthy condition which may be caused by, or incident to, medical or veterinary therapy applied to that animal, i.e., the "side effects" of such therapy.

[0023] "Fused heteropolycyclic ring system" means a saturated, partially saturated or aromatic moiety containing two or more rings, wherein at least two ring member atoms of one ring are common to a second ring containing the number of ring member atoms indicated in which at least one of the ring member atoms is a heteroatom and any carbocyclic ketone, thioketone, iminoketone or substituted derivative thereof . For example, the term "a fused heteropolycyclic radical containing 8 to 14 ring member atoms" as used in this Application to define A may include acridinyl, benzofuryl, benzooxazolyl, benzothiazolyl, carbazolyl, carbolinyl, chromanyl, chromenyl, cinnolinyl, indazolyl, indolinyl, indolyl, indolizinyl, isobenzofuryl, isochromenyl, isochromanyl, isoindolinyl, isoquinolyl, naphthyridinyl, perimidinyl, phenanthridinyl, phenanthrolinyl, phenazinyl, phenothiazinyl, phenoxathiinyl, phenoxazinyl, phthalazinyl, pteridinyl, purinyl, pyrrolizinyl, quinazolinyl, quinolizinyl, quinolyl, quinoxalinyl, quinuclidinyl, xanthenyl, and the like.

[0024] "Guanidino" means the radical -NHC(NH)NH_2. Unless indicated otherwise, the compounds of the invention containing guanidino moieties include protected derivatives thereof. Suitable protecting groups for amino moieties include acetyl, *tert*-butoxycarbonyl, benzyloxycarbonyl, and the like and both the unprotected and protected derivatives fall within the scope of the invention.

[0025] "Halo" means fluoro, chloro, bromo or iodo.

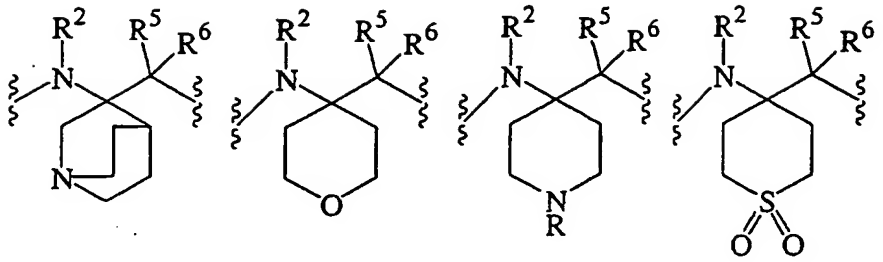
[0026] "Halo-substituted alkyl", as a group or part of a group, means "alkyl" substituted by one or more "halo" atoms, as such terms are defined in this Application. Halo-substituted alkyl includes haloalkyl, dihaloalkyl, trihaloalkyl, perhaloalkyl and the like (e.g. halo-substituted (C_{1-3})alkyl includes chloromethyl, dichloromethyl, difluoromethyl, trifluoromethyl, 2,2,2-trifluoroethyl, perfluoroethyl, 2,2,2-trifluoro-1,1-dichloroethyl, and the like).

[0027] "Heteroaryl" means aryl, as defined herein, provided that one or more of the ring member carbon atoms indicated, is replaced by heteroatom moiety selected from -N, -NR-, -O- or -S-, wherein R is hydrogen, (C_{1-6})alkyl or a protecting group, and each ring contained therein is comprised of 5 to 6 ring member atoms. For example, hetero (C_{5-12})aryl as used in this Application includes benzofuryl, benzooxazolyl, benzothiazolyl, [2,4']bipyridinylyl, carbazolyl, carbolinyl, chromenyl, cinnolinyl, furazanyl, furyl, imidazolyl, indazolyl, indolyl, indolizinyl, isobenzofuryl, isochromenyl, isooxazolyl, isoquinolyl, isothiazolyl, naphthyridinyl, oxazolyl, perimidinyl, 2-phenylpyridyl, phthalazinyl, pteridinyl, purinyl, pyrazinyl, pyradazinyl, pyrazolyl, pyridyl, pyrimidinyl, pyrrolizinyl, pyrrolidinyl, pyrrolyl, pyranyl, quinazolinyl, quinolizinyl, quinolyl, quinoxalinyl, tetrazolyl, thiazolyl, 4-thiazol-4-ylphenyl, thienyl, xanthenyl, and the like.

[0028] "Heteroatom moiety" includes -N, -NR-, -O-, -S- or -$S(O)_2$-, wherein R is hydrogen, (C_{1-6})alkyl or a protecting group.

[0029] "Heterocycloalkyl" means cycloalkyl, as defined herein, provided that one or more of the ring member carbon atoms indicated is replaced by heteroatom moiety selected from -N, -NR-, -O- or -S-, wherein R is hydrogen, (C_{1-6}) alkyl or a protecting group, and any carbocyclic ketone, thioketone or iminoketone derivative thereof (e.g. the term hetero(C_{5-12})cycloalkyl includes [1,4']bipiperidinylyl, dihydrooxazolyl, morpholinyl, 1-morpholin-4-ylpiperidinyl, piperazinyl, piperidyl, pirazolidinyl, pirazolinyl, pyrrolinyl, pyrrolidinyl, quinuclidinyl, and the like). Suitable protecting groups include *tert*-butoxycarbonyl, benzyloxycarbonyl, benzyl, 4-methoxybenzyl, 2-nitrobenzyl, and the like. For example, a compound of Formula I wherein R^1 is piperidin-4-ylcarbonyl may exist as either the unprotected or a protected derivative, e.g. wherein R^1 is 1-*tert*-butoxycarbonylpiperidin-4-ylcarbonyl, and both the unprotected and protected derivatives fall within the scope of the invention.

[0030] "Heterocycloalkylene" means cycloalkylene, as defined in this Application, provided that one or more of the ring member carbon atoms indicated, is replaced by heteroatom moiety selected from -N, -NR-, -O-, -S- or -$S(O)_2$-, wherein R is hydrogen or (C_{1-6})alkyl. For example, the instance wherein R^3 and R^4 together with the carbon atom to which both R^3 and R^4 are attached form hetero(C_{3-8})cycloalkylene" includes, but is not limited to, the following:



in which R is hydrogen, (C_{1-6})alkyl or a protecting group and R^2 is as defined in the Summary of the Invention, and any substituted derivative thereof.

[0031] "Heteromonocyclic" means a saturated, partially saturated or aromatic monocyclic radical containing the number of ring member atoms indicated in which at least one of the ring member atoms is a heteroatom and any carbocyclic ketone, thioketone, iminoketone or substituted derivative thereof. For example, the term "a heteromonocyclic containing 5 to 6 ring member atoms" as used in this Application to define A may include dihydrooxazolyl, furazanyl, furyl, imidazolyl, imidazolidinyl, imidazolinyl, isooxazolyl, isothiazolyl, thiazolyl, thienyl, morpholinyl, oxazolyl, piperazinyl, piperidinyl, pirazolidinyl, pirazolinyl, pyranyl, pyrazinyl, pyradazinyl, pyrazolyl, pyridyl, pyrimidinyl, pyrrolidinyl, pyrrolinyl, pyrrolyl, tetrazolyl, and the like.

[0032] "Heteropolycycloaryl" means polycycloaryl, as defined herein, except one or more of the ring member carbon atoms indicated are replaced by a heteroatom moiety selected from -N, -NR-, -O- or -S-, wherein R is hydrogen, (C_{1-6}) alkyl or a protecting group, and any carbocyclic ketone, thioketone or iminoketone derivative thereof.. For example, hetero(C_{8-12})polycycloaryl includes 1',2'-dihydro-2*H*-[1,4']bipyridinylyl, chromanyl, imidazolinyl, indolinyl, isochromanyl, isoindolinyl, and the like.

[0033] "Hydroxy" means the radical -OH. Unless indicated otherwise, the compounds of the invention containing hydroxy radicals include protected derivatives thereof. Suitable protecting groups for hydroxy moieties include benzyl and the like and both the unprotected and protected derivatives fall within the scope of the invention.

[0034] "Iminoketone derivative" means a derivative containing the moiety -C(NR)-, wherein R is hydrogen or (C_{1-6}) alkyl.

[0035] "Isomers" mean compounds of Formula I having identical molecular formulae but differ in the nature or sequence of bonding of their atoms or in the arrangement of their atoms in space. Isomers that differ in the arrangement of their atoms in space are termed "stereoisomers". Stereoisomers that are not mirror images of one another are termed "diastereomers" and stereoisomers that are nonsuperimposable mirror images are termed "enantiomers" or sometimes "optical isomers". A carbon atom bonded to four nonidentical substituents is termed a "chiral center". A compound with one chiral center has two enantiomeric forms of opposite chirality is termed a "racemic mixture". A compound that has more than one chiral center has 2^{n-1} enantiomeric pairs, where *n* is the number of chiral centers. Compounds with more than one chiral center may exist as ether an individual diastereomer or as a mixture of diastereomers, termed a "diastereomeric mixture". When one chiral center is present a stereoisomer may be characterized by the absolute configuration of that chiral center. Absolute configuration refers to the arrangement in space of the substituents attached to the chiral center. Enantiomers are characterized by the absolute configuration of their chiral centers and described by the *R*- and *S*-sequencing rules of Cahn, Ingold and Prelog. Conventions for stereochemical nomenclature, methods for the determination of stereochemistry and the separation of stereoisomers are well known in the art (e.g. see "Advanced Organic Chemistry", 3rd edition, March, Jerry, John Wiley & Sons, New York, 1985). It is understood that the names and illustration used in this Application to describe compounds of Formula I are meant to be encompassed all possible stereoisomers and any mixture, racemic or otherwise, thereof.

[0036] "Ketone derivative" means a derivative containing the moiety -C(O)-.

[0037] "Nitro" means the radical $-NO_2$.

[0038] "Optional" or "optionally" means that the subsequently described event or circumstance may or may not occur, and that the description includes instances where the event or circumstance occurs and instances in which it does not. For example, the phrase "(C_{1-6})alkyl optionally substituted with cyano, halo, nitro," means that the alkyl group referred to may or may not be substituted in order to fall within the scope of the invention.

[0039] "Oxalo" means the radical -C(O)C(O)OH.

[0040] "*N*-oxide derivatives" means a derivatives of compound of Formula I in which nitrogens are in an oxidized state (i.e., O-N) and which possess the desired pharmacological activity.

[0041] "Oxo" means the radical=O.

[0042] "Pathology" of a disease means the essential nature, causes and development of the disease as well as the

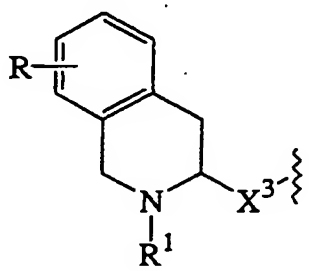
structural and functional changes that result from the disease processes.

[0043] "Pharmaceutically acceptable" means that which is useful in preparing a pharmaceutical composition that is generally safe, non-toxic and neither biologically nor otherwise undesirable and includes that which is acceptable for veterinary use as well as human pharmaceutical use.

[0044] "Pharmaceutically acceptable salts" means salts of compounds of Formula I which are pharmaceutically acceptable, as defined above, and which possess the desired pharmacological activity. Such salts include acid addition salts formed with inorganic acids such as hydrochloric acid, hydrobromic acid, sulfuric acid, nitric acid, phosphoric acid, and the like; or with organic acids such as acetic acid, propionic acid, hexanoic acid, heptanoic acid, cyclopentanepropionic acid, glycolic acid, pyruvic acid, lactic acid, malonic acid, succinic acid, malic acid, maleic acid, fumaric acid, tartatic acid, citric acid, benzoic acid, *o*-(4-hydroxybenzoyl)benzoic acid, cinnamic acid, madelic acid, methanesulfonic acid, ethanesulfonic acid, 1,2-ethanedisulfonic acid, 2-hydroxyethanesulfonic acid, benzenesulfonic acid, *p*-chlorobenzenesulfonic acid, 2-naphthalenesulfonic acid, *p*-toluenesulfonic acid, camphorsulfonic acid, 4-methylbicyclo [2.2.2]oct-2-ene-1-carboxylic acid, glucoheptonic acid, 4,4'-methylenebis(3-hydroxy-2-ene-1-carboxylic acid), 3-phenylpropionic acid, trimethylacetic acid, tertiary butylacetic acid, lauryl sulfuric acid, gluconic acid, glutamic acid, hydroxynaphthoic acid, salicylic acid, stearic acid, muconic acid and the like.

[0045] Pharmaceutically acceptable salts also include base addition salts which may be formed when acidic protons present are capable of reacting with inorganic or organic bases. Acceptable inorganic bases include sodium hydroxide, sodium carbonate, potassium hydroxide, ammonium hydroxide, aluminum hydroxide and calcium hydroxide. Acceptable organic bases include ethanolamine, diethanolamine, triethanolamine, tromethamine, *N*-methylglucamine and the like.

[0046] "Phenylene-1,2-dimethylene" means the divalent radical $-CH_2C_6H_4CH_2-$, wherein the methylene moieties are attached at the 1- and 2-positions of the phenylene moiety. For example, a group of Formula (a) in which R^{12} together with R^9 forms optionally substituted phenylene-1,2-dimethylene is illustrated by the following formula:

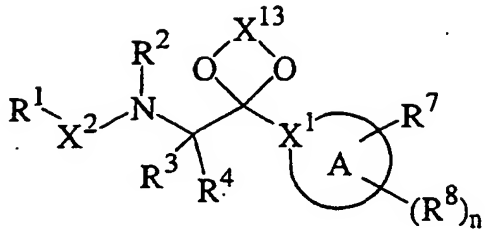


in which R is an optional hydroxy group and X^3 and R^1 are as defined in the Summary of the Invention for Formulae I and II.

[0047] "Polycycloaryl" means a bicyclic ring assembly (directly linked by a single bond or fused) containing the number of ring member carbon atoms indicated, wherein at least one, but not all, of the fused rings comprising the radical is aromatic, and any carbocyclic ketone, thioketone or iminoketone derivative thereof (e.g. (C_{9-12})polycycloaryl includes indanyl, indenyl, 1,2,3,4-tetrahydronaphthalenyl, 1,2-dihydronaphthalenyl, cyclohexylphenyl, phenylcyclohexyl, 2,4-dioxo-1,2,3,4-tetrahydronaphthalenyl, and the like).

[0048] "Prodrug" means a compound which is convertible in vivo by metabolic means (e.g. by hydrolysis) to a compound of Formula (I). For example an ester of a compound of formula (I) containing a hydroxy group may be convertible by hydrolysis in vivo to the parent molecule. Alternatively an ester of a compound of Formula (I) containing a carboxy group may be convertible by hydrolysis in vivo to the parent molecule. Suitable esters of compounds of Formula (I) containing a hydroxy group, are for example acetates, citrates, lactates, tartrates, malonates, oxalates, salicylates, propionates, succinates, fumarates, maleates, methylene-bis-b-hydroxynaphthoates, gentisates, isethionates, di-*p*-toluoyltartrates, methanesulphonates, ethanesulphonates, benzenesulphonates, p-toluenesulphonates, cyclohexylsulphamates and quinates. Suitable esters of compounds of Formula (I) containing a carboxy group, are for example those described by F.J.Leinweber, Drug Metab. Res., 1987, 18, page 379. An especially useful class of esters of compounds of Formula (I) containing a hydroxy group, may be formed from acid moieties selected from those described by Bundgaard et. al., J. Med. them., 1989, 32, page 2503-2507, and include substituted (aminomethyl)-benzoates, for example, dialkylamino-methylbenzoates in which the two alkyl groups may be joined together and/or interrupted by an oxygen atom or by an optionally substituted nitrogen atom, e.g. an alkylated nitrogen atom, more especially (morpholino-methyl)benzoates, e.g. 3- or 4-(morpholinomethyl)-benzoates, and (4-alkylpiperazin-1-yl)benzoates, e.g. 3- or 4-(4-alkylpiperazin-1-yl)benzoates. A prodrug derivative of a compound of Formula I wherein R^5 and R^6 together are

oxo is depicted by the following formula:



in which X^{13} is a bond, straight, saturated ethylene or ($-CH_2CR^{41}R^{42}CH_2-$), wherein R^{41} and R^{42} independently are hydrogen, halo or (C_{1-3})alkyl or taken together form methylene.

[0049] "Protected derivatives" means derivatives of compounds of Formula I in which a reactive site or sites are blocked with protecting groups. Protected derivatives of compounds of Formula I are useful in the preparation of compounds of Formula I or in themselves may be active cysteine protease inhibitors. For example, the compound of Formula I which is 2*S*-amino-*N*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-cyclohexylpropionamide (i.e., Compound 55, described in Example 6, infra) may be protected with a suitable amino protecting group, e.g. 9*H*-fluoren-9-ylmethoxycarbonyl, or a suitable hydroxy protecting group, e.g. *tert*-butyldimethylsilanyl, to provide, respectively, 9*H*-fluoren-9-ylmethyl 1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-cyclohexylethylcarbamate (i.e., Compound 51, described in Example 4, infra) and 2*S*-amino-*N*-[2-benzooxazol-2-yl-2-(*tert*-butyldimethylsilanyloxy)-1*S*-phenethylethyl]-3-cyclohexylpropionamide (i.e., Compound 56, described in Example 7, infra). A comprehensive list of suitable protecting groups can be found in T.W. Greene, *Protecting Groups in Organic Synthesis,* John Wiley & Sons, Inc. 1981.

[0050] "Ring member", as in fused heteropolycyclic ring system containing 8 to 14 ring member atoms, means that the atoms referred to are ring members of the fused heteropolycyclic radical, but not taking into account ring members of any substituents present. Thus, for example, a heteropolycyclic radical containing 8 ring member atoms includes benzooxaxol-2-yl, benzofur-2-yl, 1*H*-indol-5-yl, benzothiazol-2-yl, and the like.

[0051] "Sulfamoyl" means the radical $-S(O)_2NH_2$. Unless indicated otherwise, the compounds of the invention containing sulfamoyl radicals include protected derivatives thereof. Suitable protecting groups for sulfamoyl radicals include acetyl, *tert*-butoxycarbonyl, benzyloxycarbonyl, and the like and both the unprotected and protected derivatives fall within the scope of the invention.

[0052] "Therapeutically effective amount" means that amount which, when administered to an animal for treating a disease, is sufficient to effect such treatment for the disease.

[0053] "Thioketone derivative" means a derivative containing the moiety -C(S)-.

[0054] "Treatment" or "treating" means any administration of a compound of the present invention and includes:

(1) preventing the disease from occurring in an animal which may be predisposed to the disease but does not yet experience or display the pathology or symptomatology of the disease,

(2) inhibiting the disease in an animal that is experiencing or displaying the pathology or symptomatology of the diseased (i.e., arresting further development of the pathology and/or symptomatology), or

(3) ameliorating the disease in an animal that is experiencing or displaying the pathology or symptomatology of the diseased (i.e., reversing the pathology and/or symptomatology).

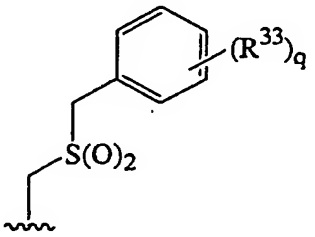
Specific Embodiments or the Invention:

[0055] While the broadest definition of the invention is set forth in the Summary of the Invention, certain aspects of the invention are preferred. A preferred aspect of the invention are compounds of Formula I in which X^1 is =C-. In particular, the heteromonocyclic ring or fused heteropolycyclic ring system A is selected from 4,5-dihydrooxazol-2-yl, benzooxazol-2-yl, benzothiazol-2-yl and oxazol-2-yl, each substituted by a group R^7 and optionally substituted with a group R^8, particularly wherein R^7 is hydrogen, halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl, nitro or phenyl and R^8 at each occurrence independently is halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl, nitro or trifluoromethyl. The ring system A preferably is benzoxazol-2-yl substituted by a group R^7 and optionally substituted with a group R^8, particularly wherein R^7 is hydrogen, halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl or nitro and R^8 at each occurrence independently is halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl, nitro or trifluoromethyl.

[0056] X^2 particularly represents a bond or a divalent group of Formula (a); particularly, wherein within Formula (a) X^3 is -C(O)-, R^9 represents hydrogen, R^{11} represents hydrogen or methyl, typically hydrogen, and R^{12} particularly

represents (i) (C_{1-6})alkyl substituted with $-SR^{14}$, $-S(O)R^{14}$ or $-S(O)_2R^{14}$, wherein R^{14} is (C_{6-12})aryl(C_{0-6})alkyl or hetero (C_{5-12})aryl(C_{0-6})alkyl or (ii) (C_{3-12})cycloalkyl$(C_{(0-6)}$alkyl or (C_{6-12})aryl(C_{0-6})alkyl; wherein within R^{12} any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6}) alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})$ OR^{14}, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl.

[0057] Further preferred, within Formula (a), R^{12} particularly represents a group having the following formula:



in which q is 0, 1, 2, 4 or 5 and R^{33} at each occurrence independently is selected from a group consisting of (C_{1-4}) alkyl, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5C(O)OR^{14}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} is (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl; more particularly in which q is 0, 1 or 2 and R^{33} at each occurrence independently is selected from a group consisting of (C_{1-4})alkyl, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-OR^{14}$, $-SR^{14}$ and $-C(O)OR^{14}$, wherein R^{14} independently is hydrogen, (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl; more particularly in which R^{33} at each occurrence independently is selected from a group consisting of (C_{1-4})alkyl,bromo, carboxy, chloro, cyano, difluoromethoxy, fluoro, iodo, methoxy, nitro, trifluoromethoxy, trifluoromethyl and trifluorosulfanyl.

[0058] Further preferred, within Formula (a), R^{12} particularly represents benzylsulfonylmethyl, 2-chlorobenzylsulfonylmethyl, 2-cyanobenzylsulfonylmethyl, 2-difluoromethoxybenzylsulfonylmethyl, 3,5-dimethylisooxazol-4-ylmethylsulfonylmethyl, 2-methoxybenzylsulfonylmethyl, 6-methylpyrid-2-ylmethylsulfonylmethyl, 2-nitrobenzylsulfonylmethyl, pyrid-2-ylmethylsulfonylmethyl, *o*-tolylmethylsulfonylmethyl or 2-trifluoromethylbenzylsulfonylmethyl.

[0059] R^1 particularly represents $-X^6X^7R^{20}$, wherein X^6 is -C(O)- or $-S(O)_2-$, X^7 is a bond, -O- or $-NR^{21}-$, wherein R^{21} is hydrogen or (C_{1-6})alkyl, and R^{20} is (i) (C_{1-6})alkyl optionally substituted by $-C(O)OR^{14}$ or (ii) (C_{3-12})Cycloalkyl(C_{0-6}) alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl or hetero(C_{5-12})aryl(C_{0-6})alkyl or (iii) (C_{3-6})cycloalkyl (C_{0-6})alkyl, hetero(C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6})alkyl or hetero(C_{5-6})aryl(C_{5-6})alkyl, wherein said cycloalkyl, heterocycloalkyl, phenyl or heteroaryl ring is substituted by $-X^5OR^{24}$,$-X^5C(O)R^{24}$, $-X^5C(O)OR^{24}$, $-X^5C(O)NR^{24}R^{25}$ $-X^5NR^{24}R^{25}$ $-X^5NR^{25}C(O)R^{24}$ $-X^5NR^{25}C(O)OR^{24}$, $-X^5NR^{25}C(O)NR^{24}R^{25}$ or $-X^5NR^{25}C(NR^{25})NR^{24}R^{25}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{24} is (C_{3-6})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6})alkyl or hetero (C_{5-6})aryl(C_{0-6})alkyl and R^{25} is hydrogen or (C_{1-6})alkyl; wherein within R^1 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 substituents independently selected from (C_{1-6})alkyl, halo, halo-substituted (C_{1-4}) alkyl, $-OR^{14}$ and $-C(O)OR^{14}$ wherein R^{14} is hydrogen or (C_{1-6})alkyl, or when X^2 is a divalent group of formula (a) then R^1 may be, but is not limited to, hydrogen or oxalo.

[0060] R^1 preferably is a group selected from acetyl, azetidin-3-ylcarbonyl, benzyloxycarbonyl, 1-benzyloxycarbonylpiperidin-4-ylcarbonyl, benzylsulfonyl, bicyclo[2.2.2]hept-2-ylcarbonyl, bicyclo[2.2.1]hept-2-ylcarbonyl, *tert*-butoxycarbonyl, carboxyacetyl, 2-carboxypropionyl, 3-carboxypropionyl, 2-cyclohexylacetyl, 4-cyclohexylbutyryl, 2-cyclohexylethylsulfonyl, cyclohexylmethoxycarbonyl, 3-cyclohexylpropionyl, 2-cyclopentylethylsulfonyl, 3-cyclopentylpropionyl, di(2-methoxyethyl)carbamoyl, dimethylcarbamoyl, 6-hydroxypyrid-3-ylcarbonyl, 1*H*-imidazol-4-ylcarbonyl, methoxycarbonyl, methylsulfonyl, 4-methylvaleryl, morpholin-4-ylcarbonyl, 2-morpholin-4-ylethylcarbonyl, naphth-1-ylacetyl, naphth-1-ylmethylcarbonyl, oxalo, 3-phenylpropionyl, piperazin-1-ylcarbonyl, piperidin-4-ylcarbonyl, pyrazin-2-ylcarbonyl, pyrid-3-ylcarbonyl, pyrid-4-ylcarbonyl, pyrid-3-ylaminocarbonyl, tetrahydropyran-4-ylcarbonyl and tetrahydropyran-4-yloxycarbonyl.

[0061] R^1 especially represents morpholin-4-ylcarbonyl, methoxycarbonyl, methylsulfonyl, piperidin-4-ylcarbonyl, pyrazin-2-ylcarbonyl pyrid-3-ylcarbonyl, pyrid-4-ylcarbonyl, tetrahydropyran-4-ylcarbonyl or tetrahydropyran-4-yloxycarbonyl.

[0062] R^2 typically is hydrogen.

[0063] R^3 particularly represents hydrogen, (C_{1-6})alkyl (optionally substituted with cyano, halo, nitro, $-SR^{26}$, -C(O)

OR^{26}, $-C(O)NR^{26}R^{26}$, $-P(O)(OR^{26})OR^{26}$, $-OP(O)(OR^{26})OR^{26}$, $-S(O)R^{27}$, $-S(O)_2R^{27}$ or $-C(O)R^{27}$, wherein R^{26} at each occurrence independently is hydrogen, (C_{1-6})alkyl, or halo-substituted (C_{1-3})alkyl and R^{27} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl) or (C_{6-12})aryl(C_{2-3})alkyl, wherein said aryl optionally is substituted further with 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, or R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-6})cycloalkylene. In particular, R^3 may be selected from hydrogen, (C_{1-4})alkyl (e.g. methyl, ethyl, *n*-propyl, *n*-butyl), phenyl(C_{2-3})alkyl (e.g. phenethyl) or (C_{1-4})alkylsulfonyl(C_{2-4})alkyl (e.g. 2-methylsulfonylethyl) or R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-6})cycloalkylene (e.g. cyclobutylene or cyclohexylene). R^3 preferably is (C_{1-4})alkyl.

[0064] R^4 particularly represents hydrogen or R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-6})cycloalkylene (e.g. cyclobutylene or cyclohexylene).

[0065] R^5 and R^6 preferably together form oxo.

[0066] Compounds of Formula II are preferred in which:

n is 0;

X^1 is =C- and the ring system A is selected from 4,5-dihydrooxazol-2-yl, benzooxazol-2-yl, benzothiazol-2-yl and oxazol-2-yl, each substituted by a group R^7 and optionally substituted with a group R^8, particularly wherein R^7 is hydrogen, halo; (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl, nitro or phenyl and R^8 at each occurrence independently is (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl, nitro or trifluoromethyl.

X^8 methylene or ethylene;

R^1, R^3 and R^4 are as defined above;

R^5 and R^6 together form oxo;

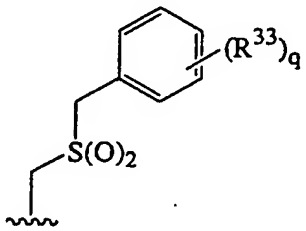
R^9 is hydrogen; and

R^{32} is $-X^9R^{34}$, wherein X^9 is methylene when X^8 is methylene and X^9 is a bond when X^8 is ethylene, R^{34} is $-CR^{35}CHR^{36}$ or $-CR^{37}{:}NR^{38}$, wherein R^{35} and R^{36} together with the atoms to which R^{35} and R^{36} are attached form (C_{2-6})alkenyl, (C_{5-12})cycloalkenyl, hetero(C_{5-12})cycloalkenyl, (C_{6-12})aryl, hetero(C_{6-12})aryl, (C_{9-12})bicycloaryl or hetero(C_{8-12})bicycloaryl and R^{31} and R^{38} together with the atoms to which R^{37} and R^{38} are attached form hetero (C_{5-12})cycloalkenyl, hetero(C_{6-12})aryl or hetero(C_{8-12})bicycloaryl, wherein within R^{34} said cycloalkenyl, heterocycloalkenyl, aryl, heteroaryl, bicycloaryl or heterobicycloaryl may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl.

R^{34} particularly represents (C_{6-12})aryl or hetero(C_{5-12})aryl, each optionally substituted by 1 to 5 radicals selected from a group consisting of (C_{1-4})alkyl, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5C(O)OR^{14}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-2})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} is (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl. R^{34} more preferably represents biphenyl, isooxazolyl, naphthyl, phenyl, pyridyl or thienyl, each optionally substituted by 1 to 5 radicals selected from a group consisting of (C_{1-4})alkyl, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5C(O)OR^{14}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^4 is a bond or (C_{1-2})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} is (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl. R^{34} more preferably represents biphenyl-2-yl, 2,4-bistrifluoromethylphenyl, 2,5-bistrifluoromethylphenyl, 4-*tert*-butylphenyl, 2-bromophenyl, 3-bromophenyl, 4-bromophenyl, 2-bromo-5-fluorophenyl, 3-chloro-2-fluorophenyl, 2-chlorophenyl, 3-chlorophenyl, 4-chlorophenyl, 5-chlorothien-2-yl, 2-chloro-5-trifluoromethyl, 2-cyanophenyl, 3-cyanophenyl, 4-cyanophenyl, 1,5-dichlorophenyl, 2,6-dichlorophenyl, 3,4-dichlorophenyl, 2,3-difluorophenyl, 2,4-difluorophenyl, 3,4-difluorophenyl, 2-difluoromethoxyphenyl, 3-difluoromethoxyphenyl, 4-difluoromethoxyphenyl, 2,5-difluorophenyl, 2,6-difluorophenyl, 3,5-dimethylisooxaxol-4-yl, 3,5-dimethylphenyl, 2-fluoro-6-nitrophenyl, 2-fluorophenyl, 4-fluorophenyl, 2-fluoro-3-trifluoromethylphenyl, 2-fluoro-4-trifluoromethylphenyl, 2-fluoro-5-trifluoromethylphenyl, 2-fluoro-6-trifluoromethylphenyl, 4-fluoro-2-trifluoromethylphenyl, 4-fluoro-3-trifluoromethylphenyl, 2-iodophenyl, 3-iodophenyl, 4-iodophenyl, 2-methoxyphenyl, 4-methoxyphenyl, 2-methylphenyl, 3-methylphenyl, 4-methylphenyl, 6-methylpyrid-2-yl, 3-methyl-2-fluorophenyl, naphth-2-yl, 2-nitrophenyl, 3-nitrophenyl, 4-nitrophenyl, 2,3,4,5,6-pentafluorophenyl, phenyl, prop-2-en-1-yl, pyrid-2-yl, pyrid-3-yl, pyrid-4-yl, thien-3-yl, o-tolyl, 2-trifluoromethoxyphenyl, 3-trifluoromethoxyphenyl, 4-trifluoromethoxyphenyl, 3-trifluoromethylphe-

nyl, 4-trifluoromethylphenyl, 2-trifluoromethylsulfanylphenyl, 3-trifluoromethylsulfanylphenyl, 4-trifluoromethylsulfanylphenyl, 2,3,4-trifluorophenyl, 2,3,5-trifluorophenyl, 2,4,6-trifluorophenyl, 2,4,5-trifluorophenyl or 2,3,6-trifluorophenyl.

[0067] A preferred group of compounds of Formula II are those in which $-X^8S(O)_2R^{32}$ represents a group having the following formula:



in which q is 0, 1, 2, 4 or 5 and R^{33} at each occurrence independently is selected from a group consisting of (C_{1-4}) alkyl, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5C(O)OR^{14}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-2})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} is (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl; more particularly in which q is 0, 1 or 2 and R^{33} at each occurrence independently is selected from a group consisting of (C_{1-4})alkyl, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-OR^{14}$, $-SR^{14}$ and $-C(O)OR^{14}$, wherein R^{14} at each occurrence independently is hydrogen, (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl; more particularly in which R^{33} at each occurrence independently is selected from a group consisting of (C_{1-4})alkyl, bromo, carboxy, chloro, cyano, difluoromethoxy, fluoro, iodo, methoxy, nitro, trifluoromethoxy, trifluoromethyl and trifluorosulfanyl. In particular, $-X^8S(O)_2R^{32}$ represents benzylsulfonylmethyl, 2-chlorobenzylsulfonylmethyl, 2-cyanobenzylsulfonylmethyl, 2-difluoromethoxybenzylsulfonylmethyl, 3,5-dimethylisooxazol-4-ylmethylsulfonylmethyl, 2-methoxybenzylsulfonylmethyl, 6-methylpyrid-2-ylmethylsulfonylmethyl, 2-nitrobenzylsulfonylmethyl, pyrid-2-ylmethylsulfonylmethyl, *o*-tolylmethylsulfonylmethyl or 2-trifluoromethylbenzylsulfonylmethyl.

[0068] Reference to the preferred embodiments set forth above is meant to include all combinations of particular and preferred groups.

[0069] Further preferred are compounds of Formula I selected from a group consisting of:

2*S*-acetylamino-*N*-(1*S*-benzooxazol-2-ylcarbonyl)-3-phenylpropyl)-3-cyclohexylpropionamide; and
N-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-cyclohexylethylisonicotinamide; and the *N*-oxide derivatives, prodrug derivatives, protected derivatives, individual isomers and mixtures of isomers; and the pharmaceutically acceptable salts thereof.

[0070] Further preferred are compounds of Formula I selected from a group consisting of:

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-benzylsulfonylethyl)morpholine-4-carboxamide;
methyl 1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-benzylsulfonylethylcarbamate;
N-(1*S*-benzooxazol-2-ylcarbonylbutyl)-2*R*-methylsulfonylamino-3-benzylsulfonylpropionamide;
N-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2*R*-(3,3-dimethylureido)-3-(2-methoxybenzylsulfonyl)propionamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-(2-methoxybenzylsulfonyl)ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-chlorobenzylsulfonyl)ethyl]morpholine-4-carboxamide;
1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethylcarbamate;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethyl]morpholine-4-carboxyamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(3,5-dimethylisoxazol-4-ylmethylsulfonylethyl]isonicoti-

namide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-nitrobenzylsulfonyl)ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-pyridin-2-ylmethylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-*o*-tolylmethylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-trifluoromethylbenzylsulfonyl)ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]nicotinamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]pyrazine-2-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-chlorobenzylsulfonyl)ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylgropylcarbamoyl)-2-(2-cyanobenzylsulfonyl)ethyl]isonicotinamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-methylsulfonylpropylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl) ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethyl]isonicotinamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(6-methylpyrid-2-ylmethylsulfonyl)ethyl]isonicotinamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-nitrobenzylsulfonyl)ethyl]moipholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-pyrid-2-ylmethylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-*o*-tolylmethylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-trifluoromethylbenzylsulfonyl)ethyl]tetrahydropyran-4-carboxamide;
tetrahydropyran-4-yl 1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethylcarbamate; and
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-cyanobenzylsulfonyl)ethyl]piperidine-4-carboxamide; and the *N*-oxide derivatives, prodrug derivatives, protected derivatives, individual isomers and mixtures of isomers; and the pharmaceutically acceptable salts thereof.

[0071] A preferred aspect of the invention are compounds of Formula I in which X^1 is =C-. In particular, the heteromonocyclic ring or fused heteropolycyclic ring system A is selected from thien-2-yl, oxazol-2-yl, 4,5-dihydrooxazol-2-yl, fur-2-yl, 1*H*-indol-5-yl, pyrid-2-yl, pyrid-3-yl, thiazol-2-yl, 1-methyl-1*H*-imidazol-2-yl, 1-benzyl-1*H*-imidazol-2-yl, benzooxazol-2-yl, benzofur-2-yl, benzothiazol-2-yl, 1*H*-benzoimidazol-2-yl, 1,1-dioxo-1*H*-1λ^6-benzo[*b*]thien-2-yl, quinol-3-yl, [1,3]dioxolan-2-yl, naphtho[2,3-*d*]oxazol-2-yl, naphtho[1,2-*d*]oxazol-2-yl and naphtho[2,1-*d*]oxazol-2-yl, each substituted by a group R^7 and optionally substituted with a group R^8, particularly wherein R^7 is halo, nitro, $-R^{29}$, $-OR^{29}$, $-C(O)R^{20}$, $-C(O)OR^{29}$,$-S(O)_2NR^{29}R^{30}$, $-C(O)NR^{29}R^{30}$ or $-C(O)NHCHR^{43}C(O)OR^{29}$, wherein R^{20} is (C_{1-6})alkyl, (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl,(C_{6-12})aryl(C_{0-6})alkyl, diphenyl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl and R^{29} is hydrogen or $-R^{20}$, wherein R^{20} is defined as above, wherein said heterocycloalkyl may be substituted with (C_{6-12})aryl(C_{0-3})alkyl, R^{30} at each occurrence is hydrogen or (C_{1-6})alkyl and R^{43} is (C_{1-6})alkyl, and R^8 at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-4})alkyl; wherein within R^7 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^6NR^{14}R^{14}$, $-X^6NR^{14}C(O)OR^{14}$, $-X^6NR^{14}C(O)NR^{14}R^{14}$, $-X^6NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^6OR^{14}$, $-X^6SR^{14}$, $-X^6C(O)OR^{14}$, $-X^6C(O)NR^{14}R^{14}$, $-X^6S(O)_2NR^{14}R^{14}$,$-X^6P(O)(OR^{14})OR^{14}$, $-X^6OP(O)(OR^{14})OR^{14}$, $-X^6NR^{14}C(O)R^{15}$, $-X^6S(O)R^{15}$, $-X^6S(O)_2R^{15}$ and $-X^6C(O)R^{15}$, wherein X^6 is a bond or (C_{1-6})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl.

[0072] The ring system A preferably is oxazol-2-yl, 4,5-dihydrooxazol-2-yl, benzooxazol-2-yl, naphtho[2,3-*d*]oxazol-2-yl, naphtho[1,2-*d*]oxazol-2-yl or naphtho[2,1-*d*]oxazol-2-yl, each substituted by a group R^7 and optionally substituted with a group R^8, particularly wherein R^7 is halo, $-R^{29}$, $-C(O)R^{20}$, $-C(O)OR^{29}$, $-C(O)NR^{29}R^{30}$ or $-S(O)_2NR^{29}R^{30}$, wherein R^{20} is (C_{1-6})alkyl, (C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl.

[0073] The ring system A more preferably is oxazol-2-yl, 4,5-dihydrooxazol-2-yl, benzooxazol-2-yl or naphtho[1,2-*d*] oxazol-2-yl, each substituted by a group R^7 and optionally substituted with a group R^8, particularly wherein R^7 is adamantan-1-ylmethylcarbamoyl, benzyl, benzylcarbamoyl, benzyl(methyl)carbamoyl, 1-benzyloxycarbonyl-3-methylbu-

tylcarbamoyl, 4-benzylpiperidin-1-carbonyl, *tert*-butyl, chloro, 2,3-dihydroindol-1-ylcarbonyl, 3,4-dihydro-1*H*-isoquinol-2-ylcarbonyl, 3,4-dihydro-1*H*-quinol-1-ylcarbonyl, diphenylmethylcarbamoyl, fur-2-ylmethylcarbamoyl, hydrogen, 2-(1*H*-indol-3-yl)ethylcarbamoyl, methoxy, methoxycarbonyl, methyl, 3-methylbutylcarbamoyl, methylcarbamoyl, 1-methylethylcarbamoyl, naphth-1-ylmethylcarbonyl, nitro, phenyl, phenylcarbamoyl, 2-phenylcyclopropylcarbamoyl, 1-phenylethylcarbamoyl, sulfamoyl, trifluoromethyl, phenethylcarbamoyl, 3-phenylpropylcarbamoyl, piperid-1-ylcarbonyl, pyrid-2-ylmethylcarbamoyl, pyrid-3-ylmethylcarbamoyl, pyrid-4-ylmethylcarbamoyl or pyrrolidin-1-ylcarbonyl and R^8 is methyl.

[0074] X^2 particularly represents a bond or a divalent group of Formula (a), wherein within Formula (a) X^3 is -C(O)-, R^9 represents hydrogen, R^{11} represents hydrogen or methyl, typically hydrogen, and R^{12} particularly represents (C_{1-6}) alkyl, preferably isobutyl, *sec*-butyl or isopropyl.

[0075] R^1 particularly represents hydrogen or $-X^8X^9R^{20}$, wherein X^8 is -C(O)- or $-S(O)_2-$, X^9 is a bond or -O- and R^{20} is (C_{1-6})alkyl, (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl$_{(0-6)}$alkyl, (C_{6-12})aryl(C_{0-6})alkyl or hetero(C_{5-12})aryl (C_{0-6})alkyl; wherein within R^1 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, $-C(O)OR^{14}$, $-X^6NR^{14}R^{14}$ and $-X^6NR^{14}C(O)OR^{14}$, wherein X^6 is a bond or (C_{1-6})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl.

[0076] R^1 particularly represents acetyl, benzoyl, benzyloxycarbonyl, benzylsulfonyl, bicyclo[2.2.2]hept-2-ylcarbonyl, tert-butoxycarbonyl, *tert*-butyryl, 4-*tert*-butoxycarbonylpiperazin-1-ylcarbonyl, 1-*tert*-butoxycarbonylpiperidin-4-ylcarbonyl, 2-cyclohexylacetyl, 4-cyclohexylbutyryl, 2-cyclohexylethylsulfonyl, 3-cyclohexylpropionyl, 2-cyclopentylethylsulfonyl, hydrogen, 4-methylpiperazin-1-ylcarbonyl, methylsulfonyl, 4-methylvaleryl, 3-morpholin-4-ylpropionyl, naphth-2-ylmethyl, 3-phenylpropionyl, piperazin-1-ylcarbonyl, piperidin-4-ylcarbonyl or pyrid-3-ylcarbonyl, wherein within R^1 any alicyclic or aromatic ring system present may be substituted further by 1 to 3 radicals independently selected from 3-aminomethyl and 3-*tert*-butoxycarbonylaminomethyl.

[0077] R^2 particularly represents hydrogen.

[0078] R^3 preferably represents (C_{1-6})alkyl or (C_{6-10})aryl(C_{1-3})alkyl, more preferably phenethyl, or R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-6})cycloalkylene, more preferably cyclopropylene.

[0079] R^4 preferably represents hydrogen or (C_{1-6})alkyl, preferably hydrogen or methyl or R^3 and R^4 or R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-6})cycloalkylene, more preferably cyclopropylene.

[0080] R^5 and R^6 preferably together form oxo.

[0081] Reference to the preferred embodiments set forth above is meant to include all combinations of particular and preferred groups.

Pharmacology and Utility:

[0082] The compounds of the invention are cysteine protease inhibitors, in particular the compounds of the invention inhibit the activity of cathepsins B, L, K and/or S and, as such, are useful for treating diseases in which cathepsin B, L, K and/or S activity contributes to the pathology and/or symptomatology of the disease. For example, the compounds of the invention are useful in treating tumor invasion and metastasis, in particular as anti-angiogenic agents, rheumatoid arthritis, osteo arthritis, pneumocystis carinii, acute pancreatitis, inflammatory airway disease and bone and joint disorders. Furthermore, the compounds of the invention are useful in treating bone resorption disorders, e.g. osteoporosis.

[0083] The compounds of the invention are inhibitors of cathepsin S and, as such, are useful for treating diseases in which cathepsin S activity contributes to the pathology and/or symptomatology of the disease. For example, the compounds of the invention are useful in treating autoimmune disorders, including, but not limited to, juvenile onset diabetes, multiple sclerosis, pemphigus vulgaris. Graves' disease, myasthenia gravis, systemic lupus erythemotasus, rheumatoid arthritis and Hashimoto's thyroiditis, allergic disorders, including, but not limited to, asthma, and allogeneic immune responses, including, but not limited to, organ transplants or tissue grafts.

[0084] Cathepsin S also is implicated in disorders involving excessive elastolysis, such as chronic obstructive pulmonary disease (e.g. emphysema), bronchiolitis, excessive airway elastolysis in asthma and bronchitis, pneumonities and cardiovascular disease such as plaque rupture and atheroma. Cathepsin S is implicated in fibril formation and, therefore, inhibitors of cathepsins S are of use in treatment of systemic amyloidosis.

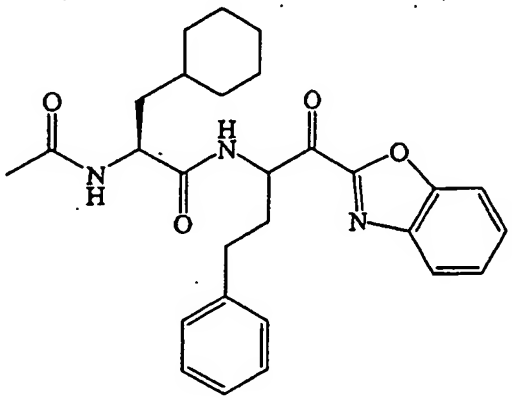
[0085] The cysteine protease inhibitory activities of the compounds of the invention can be determined by methods known to those of ordinary skill in the art. Suitable *in vitro* assays for measuring protease activity and the inhibition thereof by test compounds are known. Typically, the assay measures protease induced hydrolysis of a peptide based substrate.

[0086] Furthermore, the compounds of the invention are useful as intermediates in the preparation of other compounds of Formula I. For example, compounds of Formula I in which R^5 is hydroxy can be used to prepare compounds

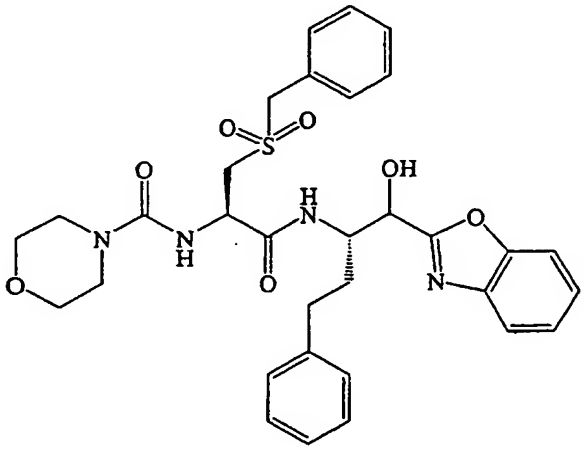
of Formula I in which R^5 and R^6 taken together form oxo.

Nomenclature:

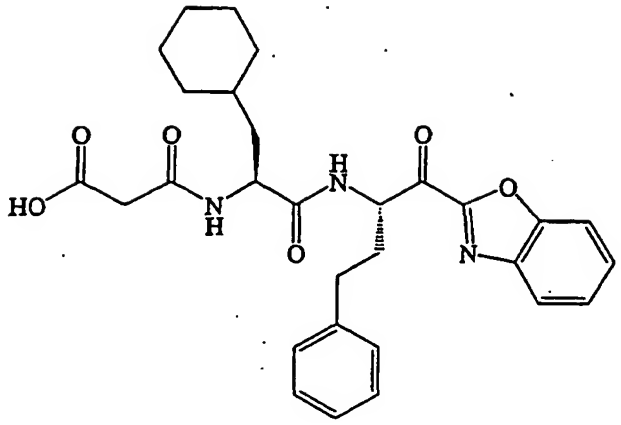
[0087] The compounds of Formula I and the intermediates and starting materials used in their preparation are named in accordance with IUPAC rules of nomenclature in which the characteristic groups have decreasing priority for citation as the principle group as follows: acids, esters, amides, etc.. Alternatively, the compounds are named by AutoNom 4.0 (Beilstein Information Systems, Inc.). For example, a compound of Formula I in which A is benzooxazol-2-yl; X^2 is a group of Formula (a), wherein R^9 is hydrogen and R^{12} is cyclohexylmethyl; R^1 is acetyl; R^2 is hydrogen; R^3 is phenethyl; R^4 is hydrogen; and R^5 and R^6 together form oxo; that is, a compound having the following structure:



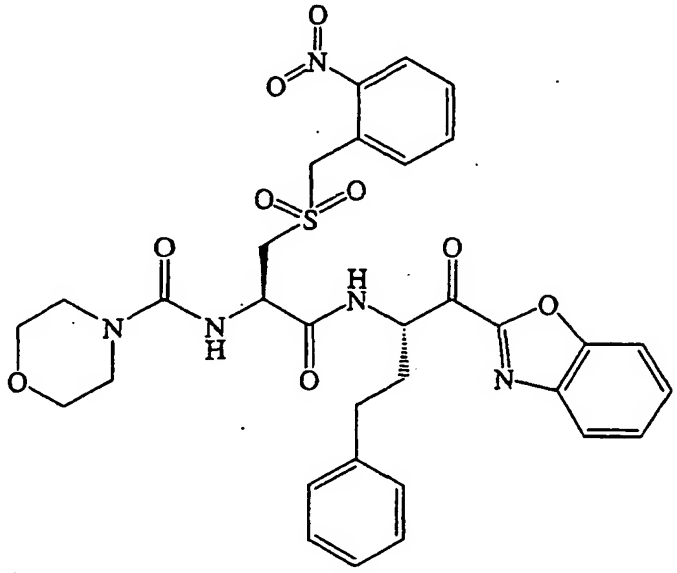
is named 2*S*-acetylamino-*N*-(1-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-3-cyclohexylpropionamide; and a compound of Formula I in which A is benzooxazol-2-yl; X^2 is a group of Formula (a), wherein R^9 is hydrogen and R^{12} is benzylsulfonylmethyl; R^1 is morpholin-4-ylcarbonyl; R^2 is hydrogen; R^3 is phenethyl; R^4 is hydrogen; R^5 is hydrogen; and R^6 is hydroxy; that is, a compound having the following structure:



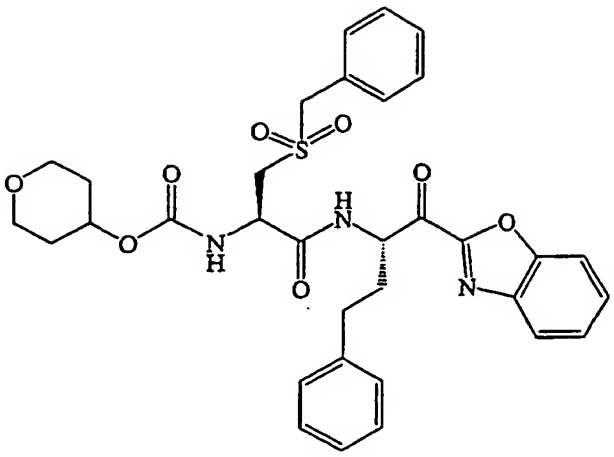
is named *N*-[1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfonylethyl]-morpholine-4-carboxamide or morpholine-4-carboxylic acid {(*R*)-1-[(*S*)-1-(1-benzooxazol-2-yl-1-hydroxy-methyl)-3-phenyl-propylcarbamoyl]-2-phenylmethanesulfonyl-ethyl}-amide; and a compound of Formula I in which A is benzooxazol-2-yl; X^2 is a group of Formula (a), wherein R^9 is hydrogen and R^{12} is cyclohexymethyl; R^1 is carboxyacetyl; R^2 is hydrogen; R^3 is phenethyl; R^4 is hydrogen; and R^5 and R^6 together form oxo; that is, a compound having the following structure:



is named *N*-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-cyclohexylethyl]malonamic acid or *N*-{(*S*)-1-[(*S*)-1-(1-benzooxazol-2-yl-methanoyl)-3-phenyl-propylcarbamoyl]-2-cyclohexyl-ethyl}-malonamic acid; and a compound of Formula I in which A is benzooxazol-2-yl; X^2 is a group of Formula (a), wherein R^9 is hydrogen and R^{12} is 2-nitrobenzylsulfonylmethyl; R^1 is morpholin-2-ylcarbonyl; R^2 is hydrogen; R^3 is phenethyl; R^4 is hydrogen; and R^5 and R^6 together form oxo; that is, a compound having the following structure:

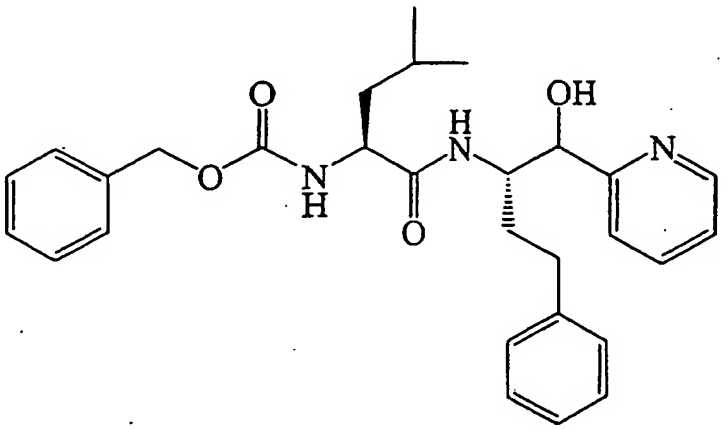


is named *N*-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-nitrobenzylsulfonyl)ethyl]morpholine-4-carboxamide or morpholine-4-carboxylic acid [(*R*)-1-[(*S*)-1-(1-benzooxazol-2-yl-methanoyl)-3-phenyl-propylcarbamoyl]-2-(2-nitro-phenylmethanesulfonyl)-ethyl]-amide; and a compound of Formula I in which A is benzooxazol-2-yl; X^2 is a group of Formula (a), wherein R^9 is hydrogen and R^{12} is benzylsulfonylmethyl; R^1 is tetrahydropyran-4-yloxycarbonyl; R^2 is hydrogen; R^3 is phenethyl; R^4 is hydrogen; and R^5 and R^6 together form oxo; that is, a compound having the following structure:

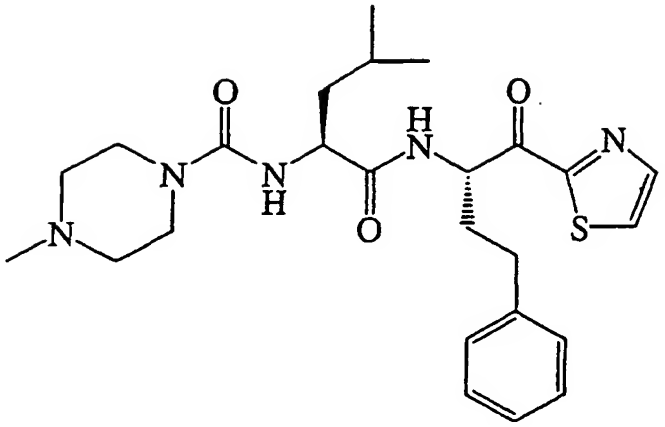


is named tetrahydropyran-4-yl 1*R*-(1S-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethylcarbamate or {(*R*)-1-[(*S*)-1-(1-benzooxazol-2-yl-methanoyl)-3-phenylpropylcarbamoyl]-2-phenylmethanesulfonyl-ethyl}-carbamic acid tetrahydro-pyran-4-yl ester.

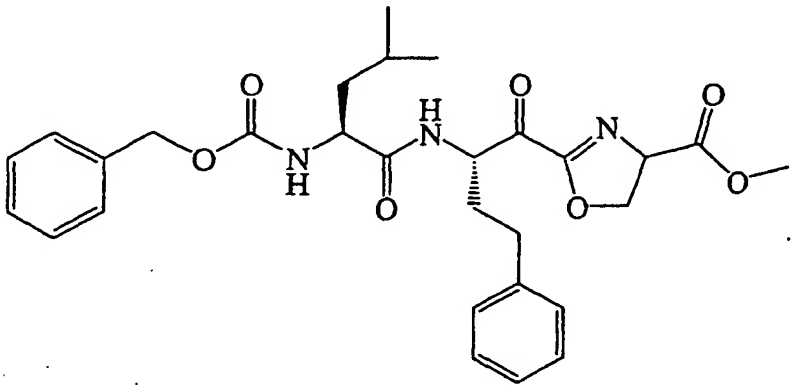
[0088] A compound of Formula I in which A is pyrid-2-yl; X^2 is a group of Formula (a), wherein R^9 is hydrogen and R^{11} is 2-methylpropyl; R^1 is benzyloxycarbonyl; R^2, R^4 and R^5 each are hydrogen; R^3 is phenethyl; and R^6 is hydroxy; that is, a compound having the following structure:



is named benzyl 1*S*-(1*S*-pyrid-2-ylcarbonyl-3-phenylpropylcarbamoyl)-3-methylbutylcarbamate or {(*S*)-1-[(*S*)-(1-hydroxy-1-pyridin-2-yl-methyl)-3-phenyl-propylcarbamoyl]-3-methyl-butyl}carbamic acid benzyl ester; and a compound of Formula I in which A is thiazol-2-yl; X^2 is a group of Formula (a), wherein R^9 is hydrogen and R^{11} is 2-methylpropyl; R^1 is 4-methylpiperazin-1-ylcarbonyl; R^2 and R^4 each are hydrogen; R^3 is phenethyl; and R^5 and R^6 together form oxo; that is, a compound having the following structure:



is named *N*-[3-methyl-1*S*-(3-phenyl-1-thiazol-2-ylcarbonylpropylcarbamoyl)butyl]-4-methylpiperazine-1-carboxamide or 4-methyl-piperazine-1-carboxylic acid or {(*S*)-3-methyl-1-[(*S*)-3-phenyl-1-(1-thiazol-2-yl-methanoyl)-propylcarbamoyl)-butyl}-amide; and a compound of Formula I in which A is 4,5-tetrahydro-4-methoxycarbonyloxazol-2-yl; X^2 is a group of Formula (a), wherein R^9 is hydrogen and R^{11} is 2-methylpropyl; R^1 is benzyloxycarbonyl; R^2 and R^4 each are hydrogen; R^3 is phenethyl; and R^5 and R^6 together form oxo; that is, a compound having the following structure:



is named methyl 2*S*-(2*S*-benzyloxycarbonylamino-4-methylvalerylamino)-4-phenylbutyryl-4,5-dihydrooxazole-4-carboxylate or 2-[(S)-2-((S)-2-benzyloxycarbonylamino-4-methylpentanoylamino)-4-phenyl-butanoyl]-4,5-dihydro-oxazole-4-carboxylic acid methyl ester.

[0089] Certain compounds of Formula I exist in tautomeric equilibrium. Compounds of Formula I which exist as tautomers are named, illustrated or otherwise described in this application as one possible tautomer. However, it is to be understood that the all possible tautomers are meant to be encompassed by such names, illustrations and descriptions.

[0090] Certain compounds of Formulae I and II exist in tautomeric equilibrium. Compounds of Formulae I and II which exist as tautomers are named, illustrated or otherwise described in this application as one possible tautomer. However, it is to be understood that the all possible tautomers are meant to be encompassed by such names, illustrations and descriptions.

Administration and Pharmaceutical Compositions:

[0091] In general, compounds of Formula I will be administered in therapeutically effective amounts via any of the usual and acceptable modes known in the art, either singly or in combination with another therapeutic agent. A therapeutically effective amount may vary widely depending on the severity of the disease, the age and relative health of the subject, the potency of the compound used and other factors. For example, therapeutically effective amounts of a compound of Formula I may range from 0.1 micrograms per kilogram body weight (μg/kg) per day to 10 milligram per kilogram body weight (mg/kg) per day, typically 1 μg/kg/day to 1 mg/kg/day. Therefore, a therapeutically effective

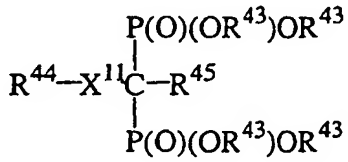
amount for a 80 kg human patient may range from 10 μg/day to 100 mg/day, typically 0.1 mg/day to 10 mg/day. In general, one of ordinary skill in the art, acting in reliance upon personal knowledge and the disclosure of this Application, will be able to ascertain a therapeutically effective amount of a compound of Formula I for treating a given disease.

[0092] The compounds of Formula I can be administered as pharmaceutical compositions by one of the following routes: oral, systemic (e.g., transdermal, intranasal or by suppository) or parenteral (e.g., intramuscular, intravenous or subcutaneous). Compositions can take the form of tablets, pills, capsules, semisolids, powders, sustained release formulations, solutions, suspensions, elixirs, aerosols, or any other appropriate composition and are comprised of, in general, a compound of Formula I in combination with at least one pharmaceutically acceptable excipient. Acceptable excipients are non-toxic, aid administration, and do not adversely affect the therapeutic benefit of the active ingredient. Such excipient may be any solid, liquid, semisolid or, in the case of an aerosol composition, gaseous excipient that is generally available to one of skill in the art.

[0093] Solid pharmaceutical excipients include starch, cellulose, talc, glucose, lactose, sucrose, gelatin, malt, rice, flour, chalk, silica gel, magnesium stearate, sodium stearate, glycerol monostearate, sodium chloride, dried skim milk, and the like. Liquid and semisolid excipients may be selected from water, ethanol, glycerol, propylene glycol and various oils, including those of petroleum, animal, vegetable or synthetic origin (e.g., peanut oil, soybean oil, mineral oil, sesame oil, or the like). Preferred liquid carriers, particularly for injectable solutions, include water, saline, aqueous dextrose and glycols.

[0094] The amount of a compound of Formula I in the composition may vary widely depending upon the type of formulation, size of a unit dosage, kind of excipients and other factors known to those of skill in the art of pharmaceutical sciences. In general, a composition of a compound of Formula I for treating a given disease will comprise from 0.01 %w to 10%w, preferably 0.3%w to 1 %w, of active ingredient with the remainder being the excipient or excipients. Preferably the pharmaceutical composition is administered in a single unit dosage form for continuous treatment or in a single unit dosage form ad libitum when relief of symptoms is specifically required.

[0095] The compounds of Formula I can be administered alone or in combination with other compounds of Formula I or in combination with one or more other active ingredient(s). For example, the compounds of Formula I can be administered in combination with a therapeutically active amount of a bisphosphonic acid or acid ester derivative or any pharmaceutically acceptable salt thereof. Suitable bisphosphonic acids and acid ester derivatives include compounds corresponding to the following formula:



wherein X^{11} is a bond or (C_{1-7})alkylene, each R^{43} independently is hydrogen or (C_{1-30})alkyl, R^{44} and R^{45} are selected independently from a group consisting of hydrogen, halo, optionally substituted (C_{1-30})alkyl, (C_{3-30})cycloalkyl, hetero (C_{5-30})cycloalkyl, optionally substituted (C_{6-10})aryl, hetero(C_{6-10})aryl, $-NR^{46}R^{46}$, $-OR^{46}$, $-SR^{46}$, wherein each R^{46} independently is hydrogen, (C_{1-10})alkyl, (C_{3-10})cycloalkyl, optionally substituted (C_{6-10})aryl, provided that both R^{44} and R^{45} are not selected from hydrogen or hydroxy when X^{11} is a bond; or R^{44} and R^{45} taken together form (C_{2-9})alkylene; wherein (C_{3-10})cycloalkyl includes adamantyl and the like, hetero(C_{5-10})cycloalkyl includes pyrrolidinyl and the like, (C_{6-10})aryl includes phenyl and naphthyl, and hetero(C_{6-10})aryl includes quinolyl, isoquinolyl, pyridyl, furyl, imidazolyl, imidazopyridyl and the like.

[0096] Instances wherein R^{44} and/or R^{45} are substituted (C_{1-30})alkyl may include, but are not limited to, (C_{1-30})alkyl substituted by hetero(C_{5-10})cycloalkyl, (C_{6-10})aryl, hetero(C_{6-10})aryl, $-NR^{47}R^{47}$, $-OR^{47}$ and $-SR^{47}$, wherein each R^{47} is independently hydrogen or (C_{1-10})alkyl; wherein hetero(C_{5-10})cycloalkyl includes pyrrolidinyl and the like, (C_{6-10})aryl includes phenyl and naphthyl, and hetero(C_{6-10})aryl includes quinolyl, isoquinolyl, pyridyl, furyl, imidazolyl, imidazopyridyl and the like. Suitable optionally substituted aryl groups include, but are not limited to, halo-substituted phenyl.

[0097] A non-limiting class of bisphosphonic acids and acid ester derivatives thereof suitable for administration in combination with compounds of Formula I include those in which R^{44} is selected from the group consisting of hydrogen, hydroxy or halo, and R^{45} is selected from the group consisting of optionally substituted (C_{1-30})alkyl, halo and $-SR^{46}$, wherein R^{46} is (C_{1-10})alkyl or phenyl.

[0098] A non-limiting subclass of bisphosphonic acids and acid ester derivatives thereof suitable for administration in combination with compounds of Formula I include those in which R^{44} is selected from the group consisting of hydrogen, hydroxy and chloro and R^{45} is selected from the group consisting of optionally substituted (C_{1-30})alkyl, chloro and chlorophenylthio.

[0099] A non-limiting example of a bisphosphonic acid suitable for administration in combination with compounds of Formula I include that in which X^{11} is a bond, each R^{43} is hydrogen, R^{44} is hydroxy and R^{45} is 3-aminopropyl, namely 4-amino-1-hydroxybutylidene-1,1-bisphosphonic acid (aka alendronic acid), or the monosodium trihydrate salt thereof, namely 4-amino-1-hydroxybutylidene-1,1-bisphosphonate monosodium trihydrate (aka alendronate monosodium trihydrate), described in U.S. Patents 4,922,007, to Kieczykowski et al., issued May 1, 1990; 5,019,651, to Kieczykowski et al., issued May 28, 1991; 5,510,517, to Dauer et al., issued April 23, 1996; 5,648,491, to Dauer et al., issued July 15, 1997, all of which patents are incorporated by reference herein in their entirety.

[0100] Further non-limiting examples of bisphosphonic acids suitable for administration in combination with compounds of Formula I include the following:

cycloheptylaminomethylene-1,1-bisphosphonic acid (aka cimadronic acid), described in U.S. Patent 4,970,335, to Isomura et al., issued November 13, 1990;
1,1-dichloromethylene-1,1-diphosphonic acid (aka clodronic acid) and the disodium salt thereof, namely clodronate disodium, described in Belgium Patent 672,205 (1966) and *J. Org. Chem 32*, 4111 (1967);
1-hydroxy-3-pyrrolidin-1-ylpropylidene-1,1-bisphosphonic acid (aka EB-1053);
1-hydroxyethylidene-1,1-diphosphonic acid (aka etidronic acid);
1-hydroxy-3-(*N*-methyl-*N*-pentylamino)propylidene-1,1-bisphosphonic acid (aka ibandronic acid), described in U.S. Patent No. 4,927,814, issued May 22, 1990;
6-amino-1-hydroxyhexylidene-1,1-bisphosphonic acid (aka neridronic acid);
3-(dimethylamino)-1-hydroxypropylidene-1,1-bisphosphonic acid (aka olpadronic acid);
3-amino-1-hydroxypropylidene-1,1-bisphosphonic acid (aka pamidronic acid);
2-pyrid-2-ylethylidene-1,1-bisphosphonic acid (aka piridronic acid), described in U.S. Patent No. 4,761,406;
1-hydroxy-2-pyrid-3-ylethylidene-1,1-bisphosphonic acid (aka risedronic acid);
4-chlorophenylthiomethylenebisphosphonic acid (aka tiludronic acid), described in U.S. Patent 4,876,248, to Breliere et al., October 24, 1989; and
1-hydroxy-2-(1*H*-imidazol-1-yl)ethylidene-1,1-bisphosphonic acid (aka zoledronic acid); all of which patents and other documents referred to above are incorporated by reference herein in their entirety.

[0101] A non-limiting subclass of bisphosphonic acids suitable for administration in combination with compounds of Formula I include those selected from the group consisting of alendronic acid, cimadronic acid, clodronic acid, tiludronic acid, etidronic acid, ibandronic acid, risedronic acid, piridronic acid, pamidronic acid, zolendronic acid, pharmaceutically acceptable salts thereof, and mixtures thereof. A further example of a bisphosphonic acid suitable for administration in combination with compounds of Formula I is alendronic acid or a pharmaceutically acceptable salt thereof, and mixtures thereof. A further non-limiting example is alendronate monosodium trihydrate.

[0102] Compounds of Formula I can be administered in combination with a therapeutically active amount of an estrogen receptor agonist. Non-limiting examples of estrogen receptor agonists suitable for administration in combination with the compounds of Formula I include naturally occurring estrogens such as estradiol, estrone and estroil, or synthetic estrogen receptor agonists such as [6-hydroxy-2-(4-hydroxyphenyl)benzo[b]thien-3-yl] {4-(2-piperidin-1-ylethoxy)phenyl]methanone (aka raloxifene) and {2-[4-(1,2-diphenylbut-1-enyl)phenoxy]ethyl}dimethylamine (aka tamoxifen). A non-limiting subclass of estrogen receptor agonists suitable for administration in combination with the compounds of Formula I include estrogen receptor partial agonists (i.e., estrogen receptor agonists with mixed agonist/antagonist properties), sometimes referred to as estrogen receptor modulators. Estrogen receptor partial agonists can exert tissue-selective estrogen agonist effects. Tamoxifen, for example, selectively exerts an estrogen agonist effect on the bone, in humans. Additional suitable estrogen receptor partial agonists are described in Tissue-Selective Actions Of Estrogen Analogs, Bone Vol. 17, No. 4, October 1995, 181S-190S. Certain 3-[4-(2-phenylindol-1-ylmethyl)phenyl] acrylamides, described in U.S. Patent 5,985,910 to Miller *et al.*, November 16, 1999; benzothiphene compounds, described in U.S. Patent 5,985,897 to Meuhl *et al.*, November 16, 1999; naphthyl compounds, described in U.S. Patent 5,952,350 to Cullinan *et al.*, September 14, 1999; substituted benzothiophene compounds, described in U.S. Patent 5,962,475 to Schmid *et al.*, October 4, 1999, are suitable estrogen receptor partial agonists for administration with the compounds of Formula I; all of which patents and other documents referred to above are incorporated by reference herein in their entirety.

[0103] More particularly a pharmaceutical composition of this invention may comprise a therapeutically effect amount of a compound of Formula I in combination with one or more active ingredient(s) selected from the group consisting of (i) a therapeutically effect amount of a bisphosphonic acid or acid ester thereof or a pharmaceutically acceptable salt thereof and (ii) a therapeutically effect amount of an estrogen receptor agonist or a pharmaceutically acceptable salt thereof; and one or more pharmaceutically acceptable excipient(s). Non-limiting examples of such bisphosphonic acids include 1,1-dichloromethylene-1,1-diphosphonic acid, 1-hydroxy-3-pyrrolidin-1-ylpropylidene-1,1-bisphosphonic acid, 1-hydroxyethylidene-1,1-diphosphonic acid, 1-hydroxy-3-(*N*-methyl-*N*-pentylamino)propylidene-1,1-bisphos-

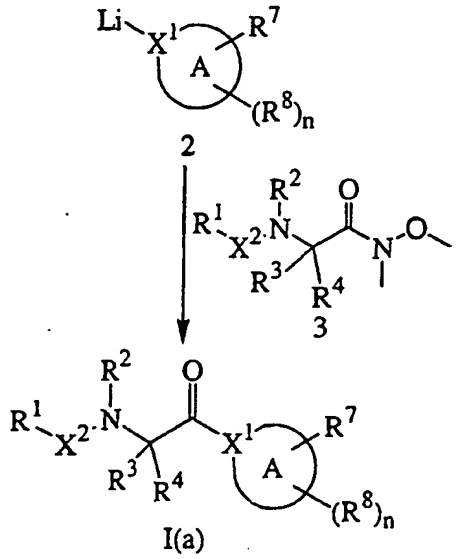
phonic acid, 6-amino-1-hydroxyhexylidene-1,1-bisphosphonic acid, 3-(dimethylamino)-1-hydroxypropylidene-1,1-bisphosphonic acid, 3-amino-1-hydroxypropylidene-1,1-bisphosphonic acid, 2-pyrid-2-ylethylidene-1,1 -bisphosphonic acid, 1-hydroxy-2-pyrid-3-ylethylidene-1,1-bisphosphonic acid, 4-chlorophenylthiomethylenebisphosphonic acid and 1-hydroxy-2-(1*H*-imidazol-1-yl)ethylidene-1,1-bisphosphonic acid or acid ester thereof or a pharmaceutically acceptable salt thereof; particularly 1,1-dichloromethylene-1,1-diphosphonic acid or a pharmaceutically acceptable salt thereof and preferably 1,1-dichloromethylene-1,1-diphosphonate monosodium trihydrate.

Chemistry:

Processes for Making Compounds of Formula I:

[0104] Compounds of Formula I in which R^5 and R^6 together form oxo can be prepared by proceeding as in the following Scheme 1:

Scheme 1

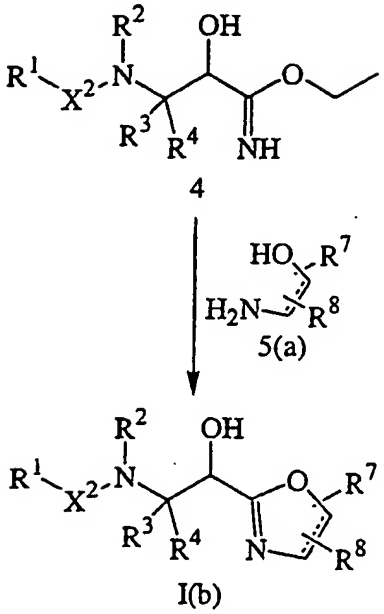


in which n, A, X^1, X^2, R^1, R^2, R^3, R^4, R^7 and R^8 are as defined in the Summary of the Invention for Formulae I and II.

[0105] Compounds of Formula I in which R^5 and R^6 together form oxo (Formula I(a)) can be prepared by reacting an organometallic compound of Formula 2 with a compound of Formula 3. The reaction is carried out in a suitable solvent (e.g. tetrahydrofuran (THF), ether, or the like) at -80 to -70° C, preferably at about -78° C, and requires 30 minutes to an hour to complete. The organometallic compound of Formula 2 is generated by treating a corresponding organo compound, or a brominated derivative thereof, with *n*-butyllithium or *tert*-butyllithium in a suitable solvent (e.g. THF, ether, or the like) at -80 to -70° C, preferably at about -78 °C, for approximately 30 minutes to an hour.

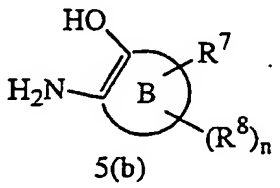
[0106] Compounds of Formula I in which the ring comprised by X^1 is a 4,5-tetrahydrooxazol-2-yl or oxazol-2-yl or moiety, R^5 is hydrogen and R^6 is hydroxy can be prepared by proceeding as in the following Scheme 2:

Scheme 2



in which X^2, R^1, R^2, R^3, R^4, R^7 and R^8 are as defined in the Summary of the Invention for Formulae I and II.

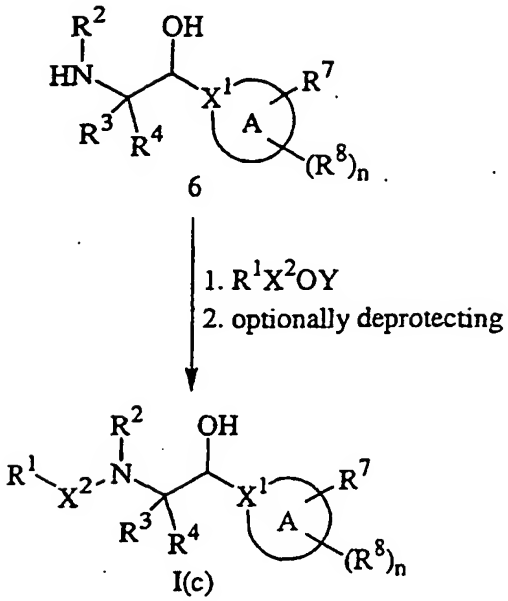
[0107] Compounds of Formula I can be prepared by reacting a compound Formula 4 with a compound of the Formula 5(a). The reaction is carried out in a suitable solvent (e.g. chloroform, ethanol, or the like) at reflux temperatures and requires 3 to 24 hours to complete. In a similar fashion, using analogous reaction conditions to those described in Scheme 1, compounds of Formula I in which A is a heteropolycyclic radical wherein X^1 is a ring member atom of an oxazole ring, R^5 is hydrogen and R^6 is hydroxy can be prepared by reacting a compound of Formula 4 with a compound of Formula 5(b):



in which n is 0, 1, 2 or 3 and B is a heteromonocyclic radical containing 5 to 6 ring member atoms or a fused heteropolycyclic radical containing 8 to 11 ring member atoms, wherein each ring contains 5 to 7 ring member atoms and each ring member atom is a carbon atom or a heteroatom, and R^7 and R^8 is as defined in the Summary of the Invention for Formulae I and II.

[0108] Compounds of Formula I can be prepared by proceeding as in the following Scheme 3:

Scheme 3

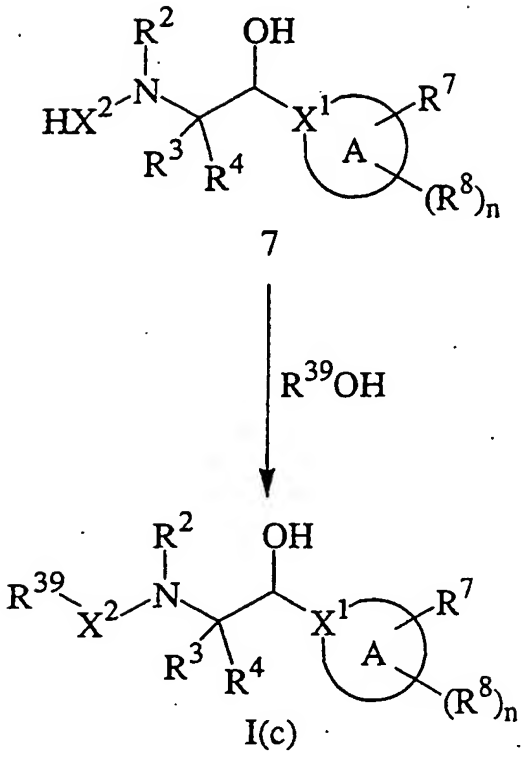


in which Y is hydrogen or an activating group (e.g. 2,5-dioxopyrrolidin-1-yl (NBS), or the like) and n, A, X^1, X^2, R^1, R^2, R^3, R^4, R^7 and R^8 are as defined in the Summary of the Invention for Formulae I and II.

[0109] Compounds of Formula I can be prepared by reacting a compound of Formula 6, or a protected derivative thereof, with a compound of the formula R^1X^2OY, or a protected derivative thereof, and then optionally deprotecting. The reaction is carried out in the presence of a suitable base (e.g. triethylamine, diisopropylethylamine, or the like) and in a suitable solvent (e.g. acetonitrile, *N,N*-dimethylformamide (DMF), dichloromethane, or any suitable combination thereof, or the like) at 10 to 30°C, preferably at about 25 °C, and requires 24 to 30 hours to complete. When Y is hydrogen a suitable coupling agent (e.g. benzotriazole-1-yloxytrispyrrolidinophosphonium hexafluorophosphate (PyBOP®), 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride (EDC), *O*-benzotriazol-1-yl-*N,N,N',N'*-tetramethyluronium hexafluorophosphate (HBTU), *O*-(7-azabenzotriazol-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate (HATU), 1,3-dicyclohexylcarbodiimide (DCC), or the like) and base (e.g. *N,N*-diisopropylethylamine, triethylamine, or the like) is required and the reaction requires 2 to 3 hours to complete. Deprotection can be effected by any means which removes the protecting group and gives the desired product in reasonable yield. A detailed description of the techniques applicable to the creation of protecting groups and their removal can be found in T.W. Greene, *Protecting Groups in Organic Synthesis*, John Wiley & Sons, Inc. 1981. Detailed descriptions of the preparation of a compound of Formula I in accordance with Scheme 3 are set forth in Examples 8, 9, 10 and 12, infra.

[0110] Compounds of Formula I can be prepared by proceeding as in the following Scheme 4:

Scheme 4



in which R^{39} is $-X^7X^8R^{20}$ and n, X^1, X^2, X^7, X^8, R^1, R^2, R^3, R^4, R^7, R^8, and R^{20} are as defined in the Summary of the Invention for Formulae I and II.

Additional Processes for Preparing Compounds of Formula I:

[0111] Compounds of Formula I in which A is optionally substituted oxazol-2-yl can be prepared by oxidizing a corresponding compound of Formula I in which A is 4,5-dihydrooxazol-2-yl. The reduction is carried out in the presence of base (e.g. 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU), 1,5-diazabicyclo[3.4.0]non-5-ene (DBN), or the like) in a suitable solvent (e.g. dichloromethane, or the like) at 20 to 25 ° C and requires 6 to 12 hours to complete.

[0112] Compounds of Formula I in which R^7 is -C(O)OH can be prepared from a corresponding compound of Formula I in which R^7 is methoxycarbonyl. The conversion can be effected by treating the methyl ester with sodium hydroxide in a suitable solvent (e.g, ethanol, or the like) at 20 to 25 °C and requires 6 to 12 hours to complete.

[0113] Compounds of Formula I in which R^7 is $-C(O)NR^{29}R^{30}$ or $-C(O)NR^{42}CHR^{43}C(O)OR^{29}$, can be prepared by reacting a corresponding compound of Formula I in which R^7 is -C(O)OH with a compound of the formula $NHR^{20}R^{21}$ or $NHR^{42}CHR^{43}C(O)OR^{29}$, respectively. The reaction is carried out in the presence of a suitable coupling agent (PyBOP®, EDC, HBTU, DCC, or the like) and base (e.g, *N,N* diisopropylethylamine, triethylamine, or the like) in a suitable solvent (e.g., DMF, or the like) at 20 to 25° C and requires 2 to 4 hours to complete.

[0114] Compounds of Formula I in R^1 is $-X^6X^7R^{20}$ can be prepared by reacting a compound of Formula I in which R^1 is hydrogen with a compound of the formula $R^{20}X^7X^6OH$. The reaction is carried out by procedures analogous to those described above for carrying out Reaction Scheme 3.

[0115] Compounds of Formula I in which R^5 and R^6 together form oxo can be prepared by oxidizing a compound of Formula I in which R^5 is hydrogen and R^6 is hydroxy. The oxidation can be carried out with a suitable oxidizing agent (e.g. Dess-Martin periodinate, or the like) in a suitable solvent (e.g. dichloromethane, or the like) at 15 to 25°C and requires 10 to 20 hours to complete.

[0116] Compounds of Formula I in which R^{12} contains a sulfonyl moiety can be prepared by oxidizing a corresponding compound of Formula I containing a sulfanyl moiety. The oxidation is carried out with a suitable oxidizing agent (e.g. potassium peroxymonosulfate (OXONE®, or the like) in a suitable solvent (e.g. methanol, water, or the like, or any suitable combination thereof) at ambient temperature and requires 16 to 24 hours to complete.

[0117] A compound of Formula I in which A is 1,1-dioxo-1*H*-1λ^6-benzo[*b*]thien-2-yl can be prepared by oxidizing a corresponding compound of Formula I in which A is benzo[*b*]thien-2-yl. Proceeding in this fashion benzyl 1-[1-(1,1-dioxo-1H-1λ^6-benzo[*b*]thien-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 209) was prepared. ^{1}H NMR ($CDCl_3$): δ 0.83 - 0.95 (m, 6H), δ 1.35 - 1.52 (m, 1H), δ 1.61 - 1.69 (m, 2H), δ 2.07 - 2.20 (m, 1H), δ 2.36 - 2.71 (m, 3H), δ 4.57 (m, 1H), δ 4.76 (m, 1H), δ 4.98 - 5.26 (m, 3H), δ 5.35 (bs, 1H), δ 7.06 - 7.62 (m, 14H);

[0118] A compound of Formula I can be prepared as a pharmaceutically acceptable acid addition salt by reacting the free base form of the compound with a pharmaceutically acceptable inorganic or organic acid. Alternatively, a pharmaceutically acceptable base addition salt of a compound of Formula I can be prepared by reacting the free acid form of the compound with a pharmaceutically acceptable inorganic or organic base. Inorganic and organic acids and bases suitable for the preparation of the pharmaceutically acceptable salts of compounds of Formula I are set forth in the definitions section of this application. Alternatively, the salt forms of the compounds of Formula I can be prepared using salts of the starting materials or intermediates.

[0119] The free acid or free base forms of the compounds of Formula I can be prepared from the corresponding base addition salt or acid addition salt form. For example, a compound of Formula I in an acid addition salt form can be converted to the corresponding free base by treating with a suitable base (e.g. ammonium hydroxide solution, sodium hydroxide, or the like). A compound of Formula I in a base addition salt form can be converted to the corresponding free acid by treating with a suitable acid (e.g. hydrochloric acid, etc).

[0120] The *N*-oxides of compounds of Formula I can be prepared by methods known to those of ordinary skill in the art. For example, *N*-oxides can be prepared by treating an unoxidized form of the compound of Formula I with an oxidizing agent (e.g. trifluoroperacetic acid, permaleic acid, perbenzoic acid, peracetic acid, *meta*-chloroperoxybenzoic acid, or the like) in a suitable inert organic solvent (e.g. a halogenated hydrocarbon such as dichloromethane) at approximately 0°C. Alternatively, the *N*-oxides of the compounds of Formula I can be prepared from the *N*-oxide of an appropriate starting material.

[0121] Compounds of Formula I in unoxidized form can be prepared from *N*-oxides of compounds of Formula I by treating with a reducing agent (e.g. sulfur, sulfur dioxide, triphenyl phosphine, lithium borohydride, sodium borohydride, phosphorus trichloride, tribromide, or the like) in an suitable inert organic solvent (e.g. acetonitrile, ethanol, aqueous dioxane, or the like) at 0 to 80°C.

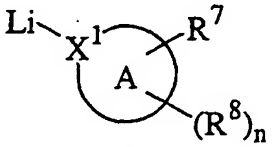
[0122] Prodrug derivatives of the compounds of Formula I can be prepared by methods known to those of ordinary skill in the art (e.g. for further details see Saulnier *et al.* (1994), *Bioorganic and Medicinal Chemistry Letters.* **4**:1985). For example, appropriate prodrugs can be prepared by reacting a non-derivatized compound of Formula I with a suitable carbamylating agent (e.g. 1,1-acyloxyalkylcarbonochloridate, *para*-nitrophenyl carbonate, or the like).

[0123] Protected derivatives of the compounds of Formula I can be made by means known to those of ordinary skill in the art. A detailed description of the techniques applicable to the creation of protecting groups and their removal can be found in T.W. Greene, *Protecting Groups in Organic Synthesis,* John Wiley & Sons, Inc. 1981.

[0124] Compounds of Formula I can be prepared as their individual stereoisomers by reacting a racemic mixture of the compound with an optically active resolving agent to form a pair of diastereoisomeric compounds, separating the diastereomers and recovering the optically pure enantiomer. While resolution of enantiomers can be carried out using covalent diasteromeric derivatives of compounds of Formula I, dissociable complexes are preferred (e.g. crystalline diastereoisomeric salts). Diastereomers have distinct physical properties (e.g. melting points, boiling points, solubilities, reactivity, and the like) and can be readily separated by taking advantage of these dissimilarities. The diastereomers can be separated by chromatography or, preferably, by separation/resolution techniques based upon differences in solubility. The optically pure enantiomer is then recovered, along with the resolving agent, by any practical means that would not result in racemization. A more detailed description of the techniques applicable to the resolution of stereoisomers of compounds from their racemic mixture can be found in Jean Jacques Andre Collet, Samuel H. Wilen, Enantiomers, Racemates and Resolutions, Honh Wiley & Sons, Inc. (1981).

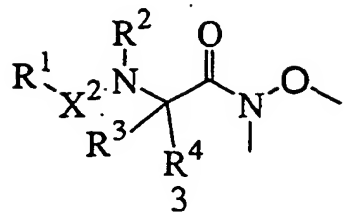
[0125] In summary, an aspect of the invention is a process for preparing a compound of Formula I, which process comprises:

(A) reacting an organometallic compound of Formula 2:



2

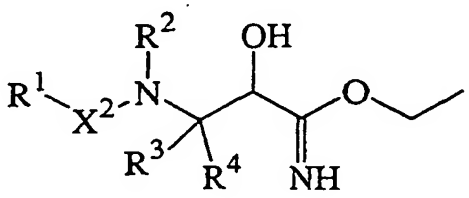
with a compound of Formula 3:



3

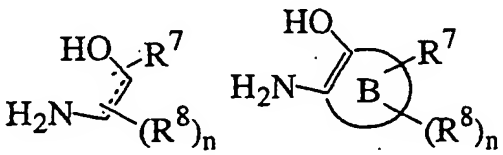
wherein n, A, X^1, X^2, R^1, R^2, R^3, R^4, R^7 and R^8 are as defined in the Summary of the Invention for Formulae I and II, to give a compound of Formula I in which R^5 and R^6 together form oxo; or

(B) reacting a compound of Formula 4:



4

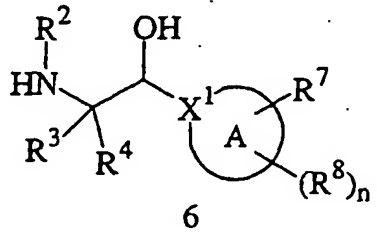
with a compound of Formula 5(a) or 5(b):



5(a) 5(b)

wherein the dashed line represents an optional bond and B is a monocyclic radical containing 5 to 6 ring member atoms or a fused polycyclic radical containing 8 to 11 ring member atoms,
wherein each ring contains 5 to 7 ring member atoms and each ring member atom is a carbon atom or a heteroatom and n, R^1, R^2, R^3, R^4, Rand R^8 are as defined in the Summary of the Invention for Formulae I and II, to give a compound of Formula I in which the ring comprised by X^1 is a 4,5-tetrahydrooxazol-2-yl or oxazol-2-yl or moiety, respectively, R^5 is hydrogen and R^6 is hydroxy or

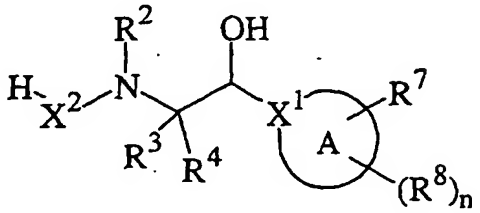
(C) reacting a compound of Formula 6:



6

with a compound of the formula R^1X^2OY, wherein Y is hydrogen or an activating group and n, A, X^1, X^2, R^1, R^2,

R^3, R^4, R^7 and R^8 are as defined in the Summary of the Invention for Formulae I and II, to give a compound of Formula I in which R^5 is hydrogen and R^6 is hydroxy; or
(D) reacting a compound of Formula 7:

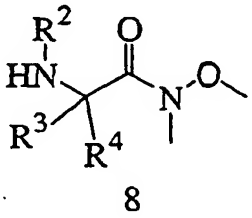


7

or a protected derivative thereof, with $R^{39}OH$, wherein R^{39} is $-X^7X^8R^{20}$ and n, A, X^1, X^2, X^7, X^8, R^2, R^3, R^4, R^7, R^8 and R^{20} are as defined in the Summary of the Invention for Formulae I and II, and deprotecting if necessary to give a compound of Formula I in which R^1 is $-X^7X^8R^{20}$,
(E) optionally oxidizing a compound of Formula I in which R^5 is hydrogen and R^6 is hydroxy to give a compound of Formula I in which R^5 and R^6 together form oxo;
(F) optionally oxidizing a compound of Formula I in which A is optionally substituted 4,5-dihydroxyoxazol-2-yl to give a compound of Formula I in which A is optionally substituted oxazol-2-yl;
(G) optionally converting a compound of Formula I in which R^7 is -C(O)OH to a compound of Formula I in which R^7 is methoxycarbonyl;
(H) optionally converting a compound of Formula I into a pharmaceutically acceptable salt;
(I) optionally converting a salt form of a compound of Formula I to non-salt form;
(J) optionally converting an unoxidized form of a compound of Formula I into a pharmaceutically acceptable *N*-oxide;
(K) optionally converting an *N*-oxide form of a compound of Formula I its unoxidized form;
(L) optionally converting a non-derivatized compound of Formula I into a pharmaceutically prodrug derivative; and
(M) optionally converting a prodrug derivative of a compound of Formula I to its non-derivatized form.

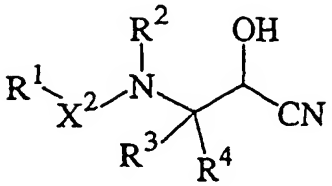
Processes for Preparing Intermediates:

[0126] Compounds of Formula 3 can be prepared by reacting a compound of the Formula 8:



8

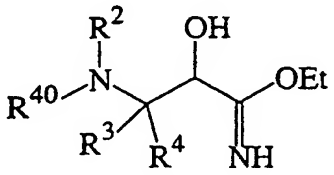
with a compound of the formula R^1X^2OY, in which Y is hydrogen or an activating group (NBS, or the like). The reaction is carried out under conditions analogous to those set for Reaction Scheme 3.
[0127] Compounds Formula 8 can be prepared by reacting a corresponding amino protected carboxylic acid with *N,O*-dimethylhydroxylamine hydrochloride and then deprotecting. The reaction with the amine is carried out in the presence of a suitable coupling agent (PyBOP®, EDC, HBTU, DCC, or the like) and base (e.g. *N,N*-diisopropylethylamine, triethylamine, or the like) in a suitable solvent (e.g. dichloromethane, DMF, or the like) at 20 to 30° C, preferably at about 25 ° C, and requires 2 to 4 hours to complete (e.g. see Reference 1, infra.). Deprotection can be effected by any means which removes the protecting group and gives the desired product in reasonable yield (e.g. see Example 2, infra.). A detailed description of the preparation of a compound of Formula 8 is set forth in References 1 and 6, infra.
[0128] Compounds of Formula 4 can be prepared by reacting a nitrile of Formula 9:



9

with ethanol. The reaction is carried out by adding the nitrile to a mixture comprising a catalytic amount of dry hydrogen chloride in a suitable solvent (e.g. chloroform, ethanol, or the like) and then allowing the reaction to proceed at 0 to 25°C for 4 to 6 hours. Dry hydrogen chloride is conveniently generated by combining a slightly excessive amount of ethanol with acetyl chloride prior to adding the imidate to the reaction mixture. Alternatively, the hydrogen chloride is introduced to the reaction medium as a gas.

[0129] Compounds of Formula 6 can be prepared by methods known to those of ordinary skill in the art. For example, compounds of Formula 6 in which A is optionally substituted benzooxazol-2-yl can be prepared by reacting a compound of Formula 10:



10

in which R^{40} is a protecting group, with 2-aminophenol and deprotecting. The reaction with the phenol is carried out in the presence of a suitable base (e.g. diisopropylethylamine, triethylamine, or the like) and in a suitable solvent (e. g. chloroform, or the like) at reflux temperatures to 25° C and requires 10 to 12 hours to complete. Deprotection can be effected by any means which removes the protecting group and gives the desired product in reasonable yield. A detailed description of the preparation of a compound of Formula 6 is set forth in Reference, infra.

[0130] Compounds of Formula 7 can be prepared by condensing a compound of Formula 6 with a compound of the formula $R^{40}X^2OY$, wherein R^{40} is a protecting group, and then deprotecting. The condensation is carried out in the presence of a suitable base (e.g. triethylamine, diisopropylethylamine, or the like) and in a suitable solvent (e.g. acetonitrile, DMF, dichloromethane, or any suitable combination thereof, or the like) at 10 to 30°C, preferably at about 25 °C, and requires 24 to 30 hours to complete. When Y is hydrogen a suitable coupling agent (e.g. PyBOP®, EDC, HBTU, HATU, DCC, or the like) and base (e.g. *N,N*-diisopropylethylamine, triethylamine, or the like) is required and the reaction requires 2 to 3 hours to complete. Deprotection can be effected by any means which removes the protecting group and gives the desired product in reasonable yield.

Examples:

[0131] The following abbreviations used in this Application area defined as follows:

PyBOP® = benzotriazole-1-yloxytrispyrrolidinophosphonium hexafluorophosphate;
THF = tetrahydrofuran;
OXONE® = potassium peroxymonosulfate;
EDC = 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride;
DMF = *N,N*-dimethylformamide;
HATU = *O*-(7-azabenzotriazol-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate;
HOBT = 1-hydroxybenzotriazole hydrate.

REFERENCE 1

Benzyl 1*S*-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate

[0132] A solution of 2-benzyloxycarbonylamino-4-phenylbutyric acid (5.05 g, 16.1 mmol) in dichloromethane (70 mL) was cooled to 0°C and treated with diisopropylethylamine (2.82 mL, 16.2 mmol) added dropwise and then PyBOP® (8.53 g, 16.4 mmol) added in one portion. The mixture was stirred for 5 minutes and then treated with *N,O*-dimethylhydroxylamine hydrochloride (1.73 g, 17.71 mmol) added in one portion. The mixture was neutralized with diisopropylethylamine (4.6 mL, 26.44 mmol) added dropwise, stirred for 2 hours at room temperature and then diluted with dichloromethane (70 mL). The dilution was washed sequentially with 1N aqueous hydrochloric acid (3x 40 mL), saturated sodium bicarbonate (3x 40 mL) and brine (40 mL) and then concentrated. The product was purified from the residue by column chromatography eluting with 2:3 ethyl acetate/hexane to provide benzyl 1*S*-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate (5.48 g, 15.4 mmol) as an oil. MS(PCI) m/z = 357 (M +1).

[0133] Proceeding as in Reference 1 provided *tert*-butyl 1*S*-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate; ^{1}H NMR ($CDCl_3$): δ 1.35 (s, 9H), δ 1.64 - 1.72 (m, 2H), δ 2.40 - 2.54 (m, 1H), δ 2.60 - 2.77 (m, 1H), δ 3.00 (s, 3H) 3.52 (s, 3H), δ 4.23 (m, 1H), δ 7.10 - 7.37 (m, 5H).

REFERENCE 2

3-(2-Cyanobenzylsulfanyl)-2*R*-pyrid-4-ylcarbonylaminopropionic acid

[0134] A mixture of isonicotinic acid (3 g), *N*-hydroxysuccinimide (2.79 g) and *N,N*-dicyclohexylcarbodiimide (5.52 g) was stirred in THF (200 mL) for 16 hours. The solid was filtered off and the solvent evaporated under reduced pressure. The residue was triturated with ethyl acetate and more solid filtered off. The filtrates were concentrated under reduced pressure gave 2,5-dioxopyrrolidin-1-yl isonicotinate (5.27 g). MS: 221 $[MH]^+$.

[0135] A solution of L-cysteine (6 g) in ethanol (57 mL) was treated sequentially with aqueous 2N sodium hydroxide solution (30 mL) and 2-bromomethylbenzonitrile (9.71 g). The reaction mixture was stirred 2 hours at room temperature then neutralized by addition of concentrated hydrochloric acid. A resulting solid was collected by filtration and wash sequentially with water, ethanol and diethylether to provide 2*R*-amino-3-(2-cyanobenzylsulfanyl)propionic acid as a white solid. MS: 237 $[MH]^+$. MS: 235 $[M]^-$.

[0136] A solution of 2*R*-amino-3-(2-cyanobenzylsulfanyl)propionic acid (590 mg) in dichloromethane was treated with 2,5-dioxopyrrolidin-1-yl isonicotinate (1.41 g) and diisopropylethyamine (0.435 mL). The reaction mixture was stirred for 6 hours and then concentrated. The residue was treated with water and a resulting insoluble solid was filtered off. The aqueous filtrate was extracted twice with ethyl acetate and the combined extracts were dried over magnesium sulfate and then concentrated to provide 3-(2-cyanobenzylsulfanyl)-2*R*-pyrid-3-carbonylaminopropionic acid (340 mg) as a gum. MS: 342 $[MH]^+$. HPLC:R_T= 10.63 minutes.

REFERENCE 3

3-Benzylsulfanyl-2*R*-tetrahydropyran-4-yloxycarbonylaminopropionic acid

[0137] A solution of tetrahydropyran-4-ol (200 mg) in acetonitrile (5 mL) was treated with bis(2,5-dioxocyclopentyl) carbonate (0.753 g) and triethylamine (0.81 mL). The reaction mixture was stirred for 4 hours at room temperature and then concentrated. The residue was dissolved in ethyl acetate and the solution was washed with a saturated sodium bicarbonate solution, dried over magnesium sulfate and then concentrated to provide 2,5-dioxo-pyrtolidin-1-yl tetrahydropyran-4-yl carbonate.

[0138] A solution of 2*R*-amino-3-benzylsulfanylpropionic acid (1 g) and triethylamine (0.8 mL) in dichloromethane (40 mL) was treated with 2,5-dioxo-pyrrolidin-1-yl tetrahydro-pyran-4-yl carbonate (1.15 g). The mixture was stirred for 16 hours at room temperature and then concentrated. The residue was dissolved in ethyl acetate and the solution was washed sequentially with hydrochloric acid and brine, dried over magnesium sulfate and then concentrated. The residue was subjected to flash column chromatography on silica eluting with a mixture of ethyl acetate and pentane (1:1, v/v) to provide 3-benzylsulfanyl-2*R*-tetrahydropyran-4-yloxycarbonylaminopropionic acid (800 mg) as an oil.

REFERENCE 4

3-Benzylsulfanyl-2*R*-morpholin-4-ylcarbonylaminopropionic acid

[0139] A solution of 3-benzylsulfanyl-2*R*-aminopropionic acid hydrochloride (25 g, 0.118 mol) in 2N sodium hydroxide

(59.mL, 0.118 mol) was cooled in an ice bath and then treated simultaneously with morpholine-4-carbonyl chloride (13.8 mL, 0.118 mol) and 1N sodium hydroxide (118 mL, 0.118 mol). The mixture was stirred at 0°C for 30 minutes and then filtered. The filtrate was acidified with 5N hydrochloric acid and extracted with ethyl acetate (5x 100 mL). The combined extracts were dried ($MgSO_4$), filtered and concentrated to provide 3-benzylsulfanyl-2*R*-morpholin-4-ylcarbonylaminopropionic acid (19.65 g, 60.6 mmol) as a white solid.

REFERENCE 5

3-Benzylsulfonyl-2*R*-morpholin-4-ylcarbonylaminopropionic acid

[0140] A solution of 3-benzylsulfanyl-2*R*-morpholin-4-ylcarbonylaminopropionic acid (17.58 g, 54.2 mmol), provided as in Reference 4, in methanol (550 mL) was treated with a solution of OXONE® (50 g, 81.4 mL) in water (550 mL). The mixture was stirred at room temperature for 2 hours and then concentrated to dryness. The residue was taken up into water (90 mL) and ethyl acetate (600 mL). The mixture was stirred vigorously and the aqueous layer was separated and extracted with ethyl acetate (2x 100 mL). The combined ethyl acetate layers were dried ($MgSO_4$) and concentrated. The residue was triturated with diethyl ether and the solid material was collected by filtration to provide 3-benzylsulfonyl-2*R*-morpholin-4-ylcarbonylaminopropionic acid.

REFERENCE 6

2-Amino-*N*-methoxy-*N*-methyl-4-phenylbutyramide trifluoroacetic acid salt

[0141] A solution of *tert*-butyl 1-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate (9.32 g, 29 mmol), provided as in Reference 1, in dichloromethane (100 mL) was cooled to 0° C and then treated with anisole (5 mL, 46.5 mmol) and trifluoroacetic acid (50 mL, 296 mmol). The mixture was stirred for 30 minutes, while allowing it to warm to room temperature, and then concentrated. The residue was dissolved in toluene (100 mL) and the solution was concentrated. The residue was again dissolved in toluene (100 mL) and concentrated to provide 2-amino-*N*-methoxy-*N*-methyl-4-phenylbutyramide trifluoroacetic acid salt (9.74 g 29 mmol) as a crude product. MS(PCI) m/z = 223 (M +1).

REFERENCE 7

Ethyl 3*S*-benzyloxycarbonylamino-2-hydroxy-5-phenylpentanimidate

[0142] A suspension comprised of lithium aluminum hydride (0.885 g, 23.3 mmol) in anhydrous diethyl ether was cooled to -45°C under nitrogen and then treated with a solution of benzyl 1*S*-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate (5.53 g, 15.53 mmol), provided as in Reference 1, in ether (75 mL) and THF (25 mL) added dropwise over a period of 30 minutes such that the temperature of the mixture was maintained at -40 to -45 ° C. The mixture was allowed to warm to 5 ° C and then recooled to -35° C. A saturated solution of sodium bicarbonate (7 mL, 0.5 M) was added dropwise and the mixture was allowed to warm to 0° C. The mixture was allowed to warm to room temperature and stirred for 1 hour to provide a precipitate. The precipitate was collected by filtration and washed with ether (100 mL). The filtrate and washings were combined and washed sequentially with ice cold 1N hydrochloric acid (2x 50 mL), saturated sodium bicarbonate (2 x 50 mL) and brine (50 mL), dried (Na_2SO_4) and concentrated *in vacuo* to provide benzyl 1*S*-formyl-3-phenylpropylcarbamate (4.01 g, 13.5 mmol) as a colorless oil. MS (PCI) m/z = 298 (M + 1).

[0143] A solution of benzyl 1*S*-formyl-3-phenylpropylcarbamate (4.557 g, 15.3 mmol) in anhydrous dichloromethane (50 mL) was stirred while sequentially treated with 2-hydroxy-2-methylpropionitrile (4.25 mL, 46.2 mmol) and triethylamine (1.28 mL, 9.20 mmol). The mixture was stirred for 4 hours at room temperature and concentrated *in vacuo*. The residue was dissolved in ether (100 mL) and the solution was washed sequentially with water (5 x 20 mL) and brine (20 mL), dried ($MgSO_4$) and concentrated to provide benzyl 2-cyano-2-hydroxy-1*S*-phenethylethylcarbamate (4.957 g, 15.3 mmol) as a yellow oil. ^1H NMR ($CDCl_3$): δ 1.75 - 2.01 (m, 2H), δ 2.08 - 2.24 (m, 1H), δ 2.51 - 2.80 (m, 2H), δ 3.70 - 4.02 (m, 1H), δ 5.07, δ 5.33 (m, 3H), δ 7.10 - 7.47 (m, 10H).

[0144] A mixture of chloroform (30 mL) and anhydrous ethanol (30 mL, 510 mmol) was cooled to 0° C and then treated with acetyl chloride (32.6 mL, 459 mmol) added dropwise over a period of 30 minutes. The mixture was cooled by adding a solution of crude benzyl 2-cyano-2-hydroxy-1S-phenethylethylcarbamate (4.957 g, 15.3 mmol) in chloroform (30 mL). The mixture was stirred for 2 hours at 0°C and then 6 hours at room temperature and concentrated *in vacuo* to provide ethyl 3S-benzyloxycarbonylamino-2-hydroxy-5-phenylpentanimidate (6.212 g 15.3 mmol) as a crude yellow oil. MS (PCI) m/z = 371 (M + 1).

REFERENCE 8

2*S*-Amino-4-phenyl-1-(4*S*-phenyl-4,5-dihydrooxazol-2-yl)butan-1-ol

[0145]

(a) A mixture comprised of ethyl 3*S*-benzyloxycarbonylamino-2-hydroxy-5-phenylpentanimidate (0.78 g, 1.92 mmol), provided as in Reference 7, diisopropylethylamine (0.218 μL, 1.26 mmol) and 2*S*-amino-2-phenylethanol (0.260 g, 1.9 mmol) in chloroform (25 mL) was heated at reflux for 3 hours and then was stirred for approximately 12 hours, while allowing to cool to room temperature. The mixture was concentrated and the residue was dissolved in ethyl acetate (50 mL). The solution was washed sequentially with 0.5N sodium hydroxide (40 mL) and brine (40 mL), dried ($MgSO_4$) and then concentrated. Product was purified from the residue by flash chromatography eluting with 1:3 hexanes/ethyl acetate to provide benzyl 2-hydroxy-2-(4,5-dihydro-4*S*-phenyloxazol-2-yl)-1*S*-phenyethylethylcarbamate (0.475 g, 1.1 mmol) as an oily mixture of diastereomers. MS (PCI) m/z = 445 (M +1). ($C_{27}H_{28}N_2O_4$).
(b) A solution comprised of benzyl 2-hydroxy-2-(4,5-dihydro-4*S*-phenyloxazol-2-yl)-1*S*-phenyethylethylcarbamate (100 mg, 0.22 mmol) in methanol (10 mL) was placed under a nitrogen atmosphere and stirred while Pearlman's catalyst (20 mg) was added. The mixture was stirred vigorously under a hydrogen atmosphere until the reaction was complete and then filtered. The filter was washed with methanol (2 x 25 mL). The combined filtrates were concentrated to provided 2*S*-amino-4-phenyl-1-(4*S*-phenyl-4,5-dihydrooxazol-2-yl)butan-1-ol (51 mg, 0.16 mmol) as a clear oil. MS (PCI) m/z = 311(M +1). ($C_{19}H_{22}N_2O_2$).

[0146] Proceeding as in Reference 8 provided methyl 2-(2*S*-benzyloxycarbonylamino-1-hydroxy-4-phenylbutyl)-4,5-dihydrooxazole-4-carboxylate.

REFERENCE 9

2*S*-Amino-1-oxazol-2-yl-4-phenylbutan-1-ol trifluoroacetic acid salt

[0147] A solution comprised of oxazole (0.25 g, 3.62 mmol) in THF (20 mL) was treated with borane tetrahydrofuran complex (3.62 mL, 3.62 mmol) under nitrogen and the mixture was stirred for 30 minutes and then cooled to -78 °C. A solution comprised of *sec*-butyl lithium (2.78 mL, 3.62 mmol) in cyclohexane was added dropwise and the mixture was stirred for 30 minutes. A solution comprised of *tert*-butyl (*S*)-1-formyl-3-phenylpropylcarbamate (0.476 g, 1.81 mmol) in THF (25 mL) was added and the mixture was stirred and allowed to warm while the reaction proceeded to completion. The mixture then was cooled to -78 °C, quenched by slowly adding 5% acetic acid in ethanol (20 mL), allowed to warm to ambient temperature and stirred for 18 hours. The mixture was concentrated to dryness and the residue was extracted with ether (2x25 mL). The combined extracts were washed with brine, dried ($MgSO_4$) and concentrated to dryness to provide *tert*-butyl 2-hydroxy-2-oxazol-2-yl-1*S*-phenethylethylcarbamate (0.125 g, 0.376 mmol) as a yellow oil. MS (PCI) m/z = 333 (M + 1).

[0148] A mixture comprised of *tert*-butyl 2-hydroxy-2-oxazol-2-yl-1*S*-phenethylethylcarbamate (0.125 g, 0.376 mmol), anisole (0.2 mL) and trifluoroacetic acid (0.6 mL) in dichloromethane (20 mL) was stirred at room temperature for 2 hours and then concentrated to provide 2*S*-amino-1-oxazol-2-yl-4-phenylbutan-1-ol trifluoroacetic acid salt (0.08 g, 0.229 mmol) as a yellow oil. MS (PCI) m/z = 233 (M + 1).

REFERENCE 10

Methyl 2-(2*S*-amino-1-hydroxy-4-phenylbutyl)oxazole-4-carboxylate

[0149] A solution comprised of methyl 2-(2*S*-benzyloxycarbonylamino-1-hydroxy-4-phenylbutyl)-4,5-dihydrooxazole-4-carboxylate (0.100 g, 0.235 mmol), provided as in Reference 10, in dichloromethane (3 mL) was cooled to 0° C and then treated with DBU (39 mL, 0.26 mmol) and bromotrichloromethane (26 mL, 0.26 mmol). The mixture was stirred for 6 hours at 0° C, washed with ammonium chloride (10 mL) and concentrated. The residue was dried ($MgSO_4$) to provide methyl 2-(2*S*-benzyloxycarbonylamino-1-hydroxy-4-phenylbutyl)oxazole-4-carboxylate. MS(PCI) m/z = 425 (M +1).

[0150] Deprotecting provided methyl 2-(2*S*-amino-1-hydroxy-4-phenylbutyl)oxazole-4-carboxylate.

REFERENCE 11

2-Benzooxazol-2-yl-2-(*tert*-butyl-dimethyl-silanyloxy)-1*S*-phenethylethylamine

[0151] A solution of 2*S*-amino-1-benzooxazol-2-yl-4-phenylbutan-1-ol (600 mg), provided as in Reference12, in dichloromethane (15 mL) was cooled to 0°C and then treated with 2,6-lutidine (0.57 mL) followed by *tert*-butyldimethylsilyl trifluoromethanesulfonate (1.08 mL). The solution was stirred for 3 hours and then additional dichloromethane was added (50 mL). The mixture was washed sequentially with a saturated sodium bi-carbonate solution (50 mL) and brine (50 mL x2), dried over magnesium sulphate and concentrated under reduced pressure to provide 2-benzooxazol-2-yl-2-(*tert*-butyl-dimethyl-silanyloxy)-1*S*-phenethylethylamine as an orange oil.

REFERENCE 12

2*S*-Amino-1-benzooxazol-2-yl-4-phenylbutan-1-ol

[0152] A solution of (S)-2-*tert*-butoxycarbonylamino-4-phenylbutyric acid (500 g, 179 mmol), EDC (37.8 g, 197 mmol), HOBT (41.1g, 269 mmol) and *N,O*-dimethylhydroxylamine hydrochloride (19.2 g, 197 mmol) in, dichloromethane (500 mL) was cooled in an ice bath and then treated with a solution of triethylamine (27.5 mL, 197 mmol) in dichloromethane (150 mL). The ice bath was removed and the reaction mixture was stir at room temperature for approximately 12 hours. The mixture was concentrated by rotary evaporation and the residue was treated with ethyl acetate (450 mL), water (300 mL) and saturated sodium bicarbonate until all solids were dissolved. The ethyl acetate layer was separated and washed sequentially with saturated sodium bicarbonate (100 mL), water (100 mL), 1N hydrochloric acid (100 mL), water (100 mL) and brine (50 mL). The solution was dried over anhydrous magnesium sulfate and concentrated to provide *tert*-butyl (*S*)-1-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate (53.41 g, 93% yield) as a clear, colorless oil.

[0153] The *tert*-butyl (S)-1-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate provided above was divided into three portions (5.0 g 15.5 mmol; 4.88 g, 15.1 mmol; and 4.54 g, 14.1 mmol). Each portion was azeotroped with toluene by rotary evaporation and dried under reduced pressure to remove residual ethyl acetate and water. Each portion of the ester was taken up into anhydrous diethyl ether (75 mL) and the mixtures were cooled in an ice bath under nitrogen. Each of the mixtures were treated with lithium aluminum hydride (1M in diethyl ether, 23.3 mL, 22.7 mL, and 21.1 mL, respectively) added by syringe and the mixtures were stirred at 0°C for 90 minutes. The mixtures were treated with ethyl acetate (5 mL), stirred for 15 minutes, further treated with saturated KH_2PO_4 (5 mL), 1N hydrochloric acid (1 mL) and then additional 1N hydrochloric acid until the solid mass dissolved. The resulting solutions were combined and extracted with ethyl acetate (3x 200 mL). The extracts were dried over anhydrous magnesium sulfate and concentrated. The residue was dried under reduced pressure to provide *tert*-butyl (S)-1-formyl-3-phenylpropylcarbamate (11.61 g, 99% yield).

[0154] A solution of *tert*-butyl (S)-1-formyl-3-phenylpropylcarbamate (11.15 g, 42.3 mmol) in dichloromethane (25 mL) was cooled in an ice bath under nitrogen and then treated sequentially with acetone cyanohydrin (10.8 mL, 119 mmol) and triethylamine (3.5 mL, 25.4 mmol). The reaction was stirred for approximately 12 hours at room temperature and then concentrated by rotary evaporation. The residue was dissolved in 1:1 hexanes:ethyl acetate (250 mL) and the solution was washed sequentially with water (3x 100 mL) and brine (50 mL), dried over anhydrous magnesium sulfate and concentrated. Product was purified from the residue by silica gel chromatography using 2:1 hexanes:ethyl acetate eluent to provide *tert*-butyl 2-cyano-2-hydroxy-1*S*-phenethylethylcarbamate (12.05 g, 98% yield).

[0155] A mixture of chloroform (12.8 mL) and absolute ethanol (9 mL, 153 mmol), under a nitrogen stream with an attached Firestone valve bubbler, was cooled in an ice bath and then treated with acetyl chloride (9.2 mL, 129 mmol) added by syringe. The mixture was allowed to stand for 5 minutes and then a solution of *tert*-butyl 2-cyano-2-hydroxy-1*S*-phenethylethylcarbamate (2.34 g, 8 mmol) in chloroform (19.2 mL) was added. The nitrogen inlet was removed and the mixture was stirred and slowly warm to room temperature over approximately 12 hours. The mixture then was concentrated by rotary evaporation and the residue was treated with absolute ethanol (40 mL)and *o*-aminophenol (873 mg, 8 mmol). The mixture was heated at 95°C under nitrogen for 5 hours and then stirred at room temperature for approximately 12 hours. The mixture was treated with diethyl ether (150 mL) and the resulting solution was washed repeatedly with 1N KOH until the aqueous wash layer was colorless. The organic phase was separated, dried over anhydrous magnesium sulfate and concentrated. The residue was recrystallized from hot hexane and a minimum amount of ethyl acetate to give a tan powder (335 mg). The mother liquor was combined with the mixed fractions from a similarly performed reaction run and purified by silica gel chromatography using 5% methanol in dichloromethane to provide 2*S*-amino-1-benzooxazol-2-phenylbutan-1-ol (1.27 g, 52% average yield) as an orange semi-solid mass.

[0156] Proceeding as in Reference 12 provided the following compounds:

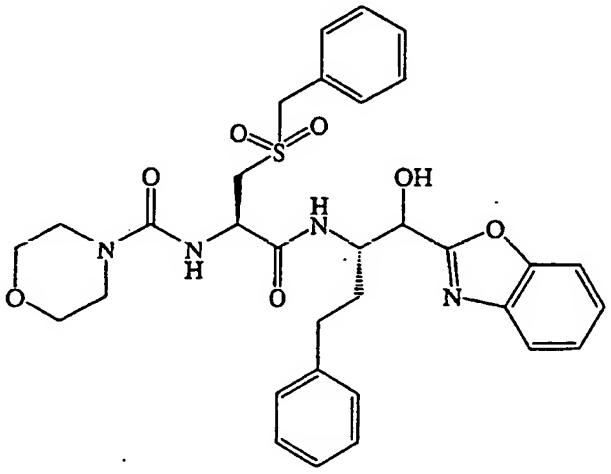
2-amino-1-benzooxazol-2-yl-ethanol;
2-amino-1-benzooxazol-2-yl-2-methyl-propan-1-ol;
(S)-2-amino-1-benzooxazol-2-yl-hexan-1-ol;
1-(1-amino-cyclopropyl)-1-benzooxazol-2-yl-methanol;
(S)-2-amino-1-benzooxazol-2-yl-propan1-ol;
(S)-2-amino-1-benzooxazol-2-yl-4-methanesulfonyl-butan-1-ol;
(S)-2-amino-1-benzooxazol-2-yl-pentan-1-ol;
(S)-2-amino-1-benzooxazol-2-yl-butan-1-ol; and
2-Amino-1-benzooxazol-2-yl-3-methoxy-propan-1-ol; ^{1}H NMR ($CDCl_3$): 7.70 (m, 1H), 7.53 (m, 1H), 7.34 (m, 2H), 4.88-5.0.(m, 1H), 3.60 (m, 1H), 3.53 (m, 3H), 3.37 (s, 1H), 3.30 (s, 1H);

EXAMPLE 1

N-[1*R*-(2-Benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfonylethyl]-morpholine-4-carboxamide

(Compound 1)

[0157]

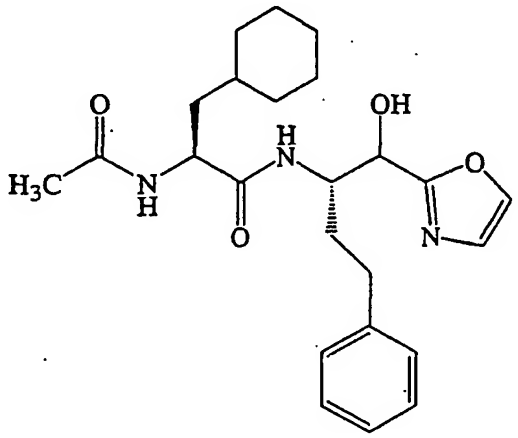


[0158] A mixture of 2*S*-amino-1-benzooxazol-2-yl-4-phenylbutan-1-ol (2.2 g, 7.8 mmol), provided as in Reference 12, 2-morpholin-4-ylcarbonylamino-3-benzylsulfonylpropionic acid (2.78 g, 7.8 mmol), EDC (1.64 g, 8.57 mmol), 1-hydroxybenzotriazole hydrate (1.58 g, 11.7 mmol) and *N*-methylmorpholine (2.4 mL, 17.1 mmol) in dichloromethane was stirred for 1 hour. The mixture was treated with additional amounts of EDC (0.1 eq) and 1-hydroxybenzotriazole hydrate (0.1 eq) and stirred for 30 minutes. The mixture was treated with an additional amount of EDC (0.1 eq) and stirred for 15 minutes. The mixture was treated with an additional amount of EDC (0.1 eq) and stirred for 30 minutes. The mixture was concentrated and the residue was taken up into ethyl acetate. The mixture was washed sequentially with 1N hydrochloric acid (3x 50 mL), saturated sodium bicarbonate solution (2x 50 mL) and brine (50 mL), dried ($MgSO_4$) and concentrated to provide *N*-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfonylethyl] morpholine-4-carboxamide (4 g, 6.44 mmol); ^{1}H NMR ($CDCl_3$): 7.68 (m, 1H), 7.52 (m, 1H), 7.10-7.45 (m, 12H), 6.0-6.25 (m, 1H), 4.95-5.1 (m, 1H), 4.52-4.80 (m, 1H), 4.15-4.5 (m, 3H), 3.1-3.75 (m, 10H), 2.69 (m, 2H), 2.06 (m, 1H), 1.80 (m, 1H); MS: m/e 621.0;

EXAMPLE 2

2*S*-Acetylamino-*N*-(2-oxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-cyclohexylpropionamide (Compound 2)

[0159]



[0160] A mixture comprised of 2-acetylamino-3-cyclohexylpropionic acid (0.45 g, 0.211 mmol), PyBOP® (0.11 g, 0.21 mmol) and diisopropylethylamine (0.037 g, 0.211 mmol) in DMF (10 mL) was stirred for 15 minutes at room temperature and a solution comprised of 2*S*-amino-1-oxazol-2-yl-4-phenylbutan-1-ol trifluoroacetic acid salt, provided as in Reference 9, in DMF and neutralized with diisopropylethylamine was added. Additional diisopropylethylamine (0.037 g, 0.211 mmol) was added and the mixture was stirred for 2 hours at room temperature and then poured into 100 mL of ice cold water. The aqueous phase was extracted with ethyl acetate (3 x 25 mL) and the combined organic layers were washed sequentially with 1 N hydrochloric acid (2 x 25 mL), water (2 x 25 mL) and brine (2 x 25 mL), dried ($MgSO_4$) and concentrated. Product was purified from the residue by flash chromatography eluting with 1:3 hexanes/ethyl acetate to provide 2*S*-acetylamino-*N*-(2-oxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-cyclohexylpropionamide (0.036 g, 0.084 mmol) as an oil. MS (ESI) m/z = 428 (M + 1); ^{1}H-NMR (300 MHz, CD_3OD): δ 0.80 (m, 2H), δ 1.12 (m, 4H), δ 1.40(m, 2H), δ 1.65 (m, 6H), δ 1.80 (m, 1H), δ 2.00 (m, 4H), δ 2.70 (m, 1H), δ 2.80 (m, 1H), δ 4.44 (m, 1H), δ 4.51 (m, 1H), δ 7.11 -7.47 (m, 6H), δ 7.99 (s, 1H), ($C_{24}H_{33}N_3O_4$).

[0161] Proceeding as in Example 2 provided the following compounds of Formula I:

3-cyclohexyl-*N*-{2-hydroxy-2-(5-phenyloxazol-2-yl)-1*S*-phenethylethyl}propionamide (Compound 3); MS (ESI) m/z = 448 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.89 (m, 2H), δ 1.20 (m, 4H), δ 1.45 (m, 1H), δ 1.65 (m, 6H), δ 1.80 (m, 1H), δ 2.09 (m, 4H), δ 2.73 (t, J = 4 Hz, 2H), δ 4.51 (m, 1 H), δ 4.96 (m, 2H), δ 6.00 (m, 1H), δ 7.11 - 7.47 (m, 9H), δ 7.60 (m, 2H), ($C_{28}H_{35}N_2O_3$):

2*S*-acetylamino-*N*-[2-hydroxy-1*S*-phenethyl-2-(5-phenyloxazol-2-yl)ethyl]-3-cyclohexylpropionamide (Compound 4); MS (ESI) m/z = 505 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.80 (m, 2H), δ 1.12 (m, 4H), δ 1.40 (m, 2H), δ 1.65 (m, 6H), δ 1.80 (m, 1H), δ 2.00 (m, 5H), δ 2.70 (m, 2H), δ 4.51 (m, 1H), δ 4.96 (m, 2H), δ 6.19 (m, 1H), δ 6.98 (m, 1H), δ 7.11 - 7.47 (m, 9H), δ 7.62 (m, 2H), ($C_{30}H_{38}HN_3O_4$); and

N-(1*S*-benzothiazol-2-ylcarbonyl-3 phenylpropyl)-3-cyclohexylpropionamide (Compound 5); ^{1}H NMR: δ 0.83 (m, 2H), δ 1.20 (m, 5H), δ 1.48 (q, 2H, J= 9 Hz), δ 1.67 (m, 4H), δ 2.20 (m, 3H), δ 2.48 (m, 1H), δ 2.75 (m, 2H), δ 5.95 (m, 1H), δ 6.35 (d, 1H, J = 9 Hz), δ 7.25 (m, 5H), δ 7.57 (m, 2H), δ 7.93 (d, 1H, J = 9 Hz), δ 8.18 (d, 1H, J = 9 Hz); ES-MS m/z 435 (MH+); and

2*S*-acetylamino-*N*-(1*S*-benzothiazol-2-ylcarbonyl-3-phenylpropyl)-3-cyclohexylpropionamide (Compound 6); ^{1}H NMR: δ 0.87 (m, 8H), δ 1.22 (m, 6H), δ 1.92 (m, 1H), δ 2.12 (m, 1H), δ 2.48 (m, 1H), δ 2.78 (m, 2H), δ 3.87 (d, 1H, J = 7 Hz), δ 5.62 (m, 1H), δ 7.20 (m, 6H), δ 7.53 (m, 2H), δ 7.98 (d, 1H, J = 7 Hz), δ 8.18 (d, 1H, J = 7 Hz); ES-MS m/z 492 (MH+).

N-[1*S*-(1*S*-phenethyl-2-benzooxazol-2-yl-1-oxoethylcarbamoyl)-2-naphth-2-ylethyl]piperidine-4-carboxamide (Compound 7), ^{1}H NMR (DMSO-d_6): δ 1.32 - 1.76 (m, 4H), δ 1.90 - 2.09 (m, 2H), δ 2.22 - 2.60 (m, 2H), δ 2.65 - 3.26 (m, 6H), δ 4.72 - 4.86 (m, 1H), δ 5.26 (m, 1H), δ 7.06 - 7.31 (m, 5H), δ 7.45 (m, 4H), δ 7.55 (dt, J = 1.26, 7.84 Hz, 1H), δ 7.65 (dt, J = 1.18, 8.00 Hz, 1H), δ 7.72 - 7.88 (m, 3H), δ 7.90 (d, J = 8.06 Hz, 1H), δ 7.99 (d, J = 7.86

Hz, 1H), δ 8.14 (bs, 1H), δ 8.24 (d, J = 8.04 Hz, 1H), δ 8.46 (bs, 1H), δ 8.94 (d, J = 6.43 Hz, 1H);
2*S*-acetylamino-*N*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-3-cyclohexylpropionamide (Compound 8); MS (ESI) m/z = 476 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.85 (m, 2H), δ 1.26 (m, 4H), δ 1.47 (m, 2H), δ 1.64 (m, 6H), δ 1.99 (s, 3H), δ 2.15 (m, 2H), δ 2.41 (m, 1H), δ 2.72 (t, J = 6Hz, 2H), δ 4.59 (q, J = 4Hz, 1H), δ 5.65 (q, J = 2Hz, 1H), δ 6.26 (d, J = 6 Hz, 1H), δ 7.10 - 7.26 (m, 6H), δ 7.41 - 7.65 (m, 3H), δ 7.86 (d, J = 6Hz 1H), ($C_{28}H_{33}N_3O_4$);
tert-butyl 1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl) 2-cyclohexylethylcarbamate (Compound 9);
N-[1-(benzooxazol-2-ylcarbonyl)-3-phenylpropyl]-3-cyclohexylpropionamide (Compound 10);
3-cyclohexyl-*N*-[3*S*-phenyl-1-(5-phenyloxazol-2-ylcarbonyl)propyl]propionamide (Compound 11); MS (ESI) m/z = 445 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.89 (m, 2H), δ 1.20 (m, 4H), δ 1.55 (m, 2H), δ 1.68 (m, 6H), δ 2.12 (m, 1H), δ 2.27 (t, J = 4Hz, 2H), δ 2.48 (m, 1H), δ 2.76 (m, 2H), δ 5.70 (m, 1H), δ 6.35 (d, J = 4 Hz, 1H), δ 7.19 - 7.30 (m, 5H), δ 7.48 (m, 3H), δ 7.57 (s, 1H), δ 7.79 (d, J = 4Hz, 2H), ($C_{28}H_{32}N_2O_3$);
2S-acetylamino-*N*-[1S-(5-phenyloxazol-2-ylcarbonyl)-3-phenylpropyl]-3-cyclohexylprionamide (Compound 12); MS (ESI) m/z = 502 (M + 1);^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.80 (m, 2H), δ 1.12 (m, 4H), δ 1.50 (m, 1H), δ8 1.65 (m, 6H), δ 1.80 (m, 1H), δ 2.05 (s, 3H), δ 2.12 (m, 1H), δ 2.48 (m, 1H), δ 2.70 (t, J = 6Hz, 2H), δ 4.52 (q, J = 2Hz, 1H), δ 5.60 (q, J = 2Hz, 1H), δ 5.98 (d, J = 6 Hz, 1H), δ 6.92 (d, J = 6Hz, 1H), δ 7.19 - 7.30 (m, 5H), δ 7.48 (m, 3H), δ 7.57 (s, 1H), δ 7.79 (d, J = 4Hz, 2H), ($C_{30}H_{35}N_3O_4$);
benzyl 1*S*-(benzooxazol-2-ylcarbonylmethylcarbamoyl)-3-methylbutylcarbamate (Compound 13);
benzyl 1*S*-(5-phenylbenzooxazol-2-ylcarbonylmethylcarbamoyl)-3-methylbutylcarbamate (Compound 14);
2*S*-acetylamino-*N*-(1*S*-oxazol-2-ylcarbonyl-3-phenypropyl)-3-cyclohexylpropionamide (Compound 15); MS (ESI) m/z = 426 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.85 (m, 2H), δ 1.20 (m, 4H), δ 1.50 (m, 2H), δ 1.65 (m, 6H), δ 2.05 (s, 3H), δ 2.48 (m, 1H), δ 2.70 (t, J = 6Hz, 2H), δ 4.52 (q, J = 2Hz, 1H), δ 5.60 (q, J = 2Hz, 1H), δ 5.93 (d, J = 6 Hz, 1H), δ 6.89 (d, J = 6Hz, 1H), δ 7.19 - 7.38 (m, 5H), δ 7.47 (s, 1H), δ 7.79 (s, 1H), ($C_{24}H_{31}$,N_3O_4);
benzyl 1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamate (Compound 16);
2-acetylamino-*N*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-3-phenylpropionamide (Compound 17);
N-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropyl)benzylsulfonamide (Compound 18); ^{1}H NMR ($CDCl_3$): 7.88 (d, J=6.2Hz, 1H), 7.67 (d, J=6.2Hz, 1H), 7.60 (t, J=6.2Hz, 1H), 7.51 (t, J=6.2Hz, 1H), 7.35 (d, J=6.2Hz, 2H), 7.08-7.29 (m, 7H), 6.96 (t, J=6.2Hz, 1H), 5.52 (d, JK=9.4 Hz, 1H), 4.90 (td, J=9.4, 3.1Hz, 1H), 4.31 (dd, J=10.9, 10.9Hz, 2H), 2.80 (m, 1H), 2.27 (m, 1H), 2.04 (m, 1H); MS: m/e=435.0;
N-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-2-cyclohexylethanesulfonamide (Compound 19); ^{1}H NMR ($CDCl_3$): 7.94 (d, J=6.3Hz, 1H), 7.70 (d, J=6.3Hz, 1H), 7.62 (t, J=6.3Hz, 1H), 7.52 (t, J=6.3Hz, 1H), 7.17-7.34 (m, 5H), 5.42 (d, J=9.5Hz, 1H), 5.17-5.25 (m, 1H), 2.79-3.09 (m, 4H), 2.38-2.55 (m, 1H), 2.08-2.21 (m, 1H), 1.52-1.79 (m, 7H), 1.08-1.34 (m, 4H), .77-1.01 (m, 2H); MS m/e=455.1;
N-(1-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-3-cyclopentylpropionamide (Compound 20);
N-(1*S*-benzooxazol-2-ylcarbonyl-3 phenylpropyl)-2-cyclohexylacetamide (Compound 21);
N-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropyl]-2-bicyclo[2.2.1]hept-2-ylacetamide (Compound 22);
N-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-4-methylpentanamide (Compound 23);
N-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-2-naphthalen-1-ylacetamide (Compound 24); ^{1}H NMR ($CDCl_3$): 7.96 (m, 1H), 7.84 (m, 2H), 7.82 (m, 1H), 7.42-7.75 (m, 6H), 7.14 (m, 4H), 6.86 (m, 2H), 6.25 (m, 1H), 5.64 (m, 2H), 4.08 (m, 1H), 2.45 (m, 2H),2.42 (m, 1H), 1.90 (m, 1H);
N-(1-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-3-phenylpropionamide (Compound 25); ^{1}H NMR ($CDCl_3$): 7.90 (d,J=8.0Hz, 1H), 7.65 (d,J=8.0Hz, 1H), 7.59 (m, 1H), 7.56 (m, 1H), 7.05-7.35 (m, 11H), 6.20 (d, J=7.0Hz, 1H), 5.76 (m, 1H), 2.97 (m, 2H), 2.5-2.7 (m, 4H), 2.4 (m, 1H), 2.1 (m, 1H);
methyl 2-[2-(3*S*-cyclohexylpropionylaminol-4-phenylbutyryl]-4,5-dihydrooxazole-4*S*-carboxylate (Compound 26); MS (ESI) m/z = 429 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.89 (m, 2H), δ 1.22 (m, 4H), δ 1.51 (m, 1H), δ 1.65 (m, 6H), δ 2.05 (m, 1H), δ 2.20 (t, J = 4 Hz, 2H), δ 2.46 (m, 1H), δ 2.73 (m, 2H), δ 3.80 (s, 3H), δ 4.55 (m, 1H), δ 4.60 (m, 1H), δ 5.00 (m, 1H), δ 5.45 (m, 1H), δ 6.15 (m, 1H), δ 7.13 - 7.35 (m, 5H), ($C_{24}H_{32}N_2O_5$);
methyl 2-[2-(3*S*-cyclohexylpropionylamino)-4-phenylbutyryl]oxazole-4-carboxylate (Compound 27); MS (ESI) m/z = 427 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.89 (m, 2H), δ 1.22 (m, 4H), δ 1.49 (m, 1H), δ 1.65 (m, 6H), δ 2.20 (m, 3H), δ 2.46 (m, 1H), δ 2.74 (m, 2H), δ 3.99 (s, 3H), δ 5.62 (m, 1H), δ 6.20 (d, J = 4Hz, 1H), δ 7.15 - 7.35 (m, 5H), δ 8.40 (s, 1H), ($C_{24}H_{30}N_2O_5$);
benzyl 1*S*-(1*S*-benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoy)-2-naphthalen-2-ylethylcarbamate (Compound 28);
2-acetylamino-*N*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylprogyl]-3-(2-fluorophenyl)propionamide (Compound 29);
2*S*-acetylamino-*N*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropil)-2-methyl-3-phenylpropionamide (Compound 30);
tert-butyl 1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl]-3-phenylpropylcarbamate (Compound

31);

N-(1-benzooxazol-2-ylcarbonyl)-3-phenylpropyl)-4-cyclohexylbutyramide (Compound 32); ^{1}H NMR ($CDCl_3$): 7.94 (d, J=7.9Hz, 1H), 7.68 (d, 7.9Hz, 1H), 7.58 (t,J=7.9Hz, 1H), 7.50 (t, J=7.9Hz, 1H), 7.10-7.32 (m, 5H), 6.27 (d, J=11.8Hz, 1H), 5.76-5.89 (m, 1H), 2.74-2.89 (m, 2H), 2.42-2.61 (m, 1H), 2.11-2.32 (m, 3H), 1.53-1.79 (m, 9H), 1.05-1.32 (m, 4H), 0.79-1.0 (m, 2H); MS: m/e=433;

methyl 2-[2*S*-(3-cyclohexylpropionylamino)-4-phenylbutyryl]-4,5-dihydrooxazol-4*S*-ylcarboxylate (Compound 33); MS (ESI) m/z = 429 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.89 (m, 2H), δ 1.22 (m, 4H), δ 1.51 (m, 1H), δ 1.65 (m, 6H), δ 2.05 (m, 1H), δ 2.20 (t, J = 4 Hz, 2H), δ 2.46 (m, 1H), δ 2.73 (m, 2H), δ 3.80 (s, 3H), δ 4.58 (m, 2H), δ 5.00 (m, 1H), δ 5.45 (m, 1H), δ 6.15 (m, 1H), δ 7.13 - 7.35 (m, 5H), ($C_{24}H_{32}N_2O_5$);

3-cyclohexyl-*N*-[1-(5-methoxybenzooxazol-2-ylcarbonyl)-3-phenylpropyl]propionamide (Compound 34); MS (ESI) m/z = 449 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.95 (m, 2H), δ 1.22 (m, 4H), δ 1.51 (m, 2H), δ 1.65 (m, 6H), δ 2.15 (m, 1H), δ 2.20 (t, J = 4 Hz, 2H), δ 2.50 (m, 1H), δ 2.77 (q, J = 2 Hz, 2H), δ 3.92 (s, 3H), δ 5.78 (m, 1H), δ 6.37 (m, 1H), δ 7.13 - 7.35 (m, 5H), δ 7.53 (d, J = 6 Hz, 1H), ($C_{27}H_{32}N_2O_4$);

2-acetyl-*N*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-1,2,3,4-tetrahydroisoquinoline-3*S*-carboxamide (Compound 35);

2*S*-acetylamino-*N*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-3-(2-chlorophenyl)propionamide (Compound 36);

3-cyclohexyl-*N*-[1*S*-(6-methoxybenzooxazol-2-ylcarbonyl)-3-phenylpropyl]propionamide (Compound 37); MS (ESI) m/z = 449 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.95 (m, 2H), δ 1.22 (m, 4H), δ 1.51 (m, 2H), δ 1.65 (m, 6H), δ 2.15 (m, 1H), δ 2.20 (t, J = 4 Hz, 2H), δ 2.50 (m, 1H), δ 2.77 (q, J = 2 Hz, 2H), δ 3.95 (s, 3H), δ 5.78 (m, 1H), δ 6.37 (d, J = 6 Hz, 1H), δ 7.10 - 7.35 (m, 5H), δ 7.77 (d, J = 6 Hz, 1H), ($C_{27}H_{32}N_2O_4$);

3-cyclohexyl-*N*-[1*S*-(5-trifluoromethylbenzooxazol-2-ylcarbonyl)-3-phenylpropyl]propionamide (Compound 38); MS (ESI) m/z = 487 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.95 (m, 2H), δ 1.22 (m, 4H), δ 1.51 (m, 1H), δ 1.65 (m, 6H), δ 2.20 (m, 3H), δ 2.51 (m, 1H), δ 2.80 (q, J = 2 Hz, 2H), δ 5.76 (m, 1H), δ 6.22 (d, J = 6 Hz, 1H), δ 7.15 - 7.35 (m, 5H), δ 7.77 (m, 2H), δ 8.25(s, 1H), ($C_{27}H_{29}F_3N_2O_3$);

2-acetylamino-*N*(1-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-3-(2-trifluoromethylphenyl)propionamide (Compound 39);

N-(1-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-3-morpholin-4-ylpropionamide (Compound 40);; ^{1}H NMR ($CDCl_3$): 7.90 (m, 1H), 7.76 (m, 1H), 7.06-7.36 (m, 7H), 4.00 (m, 1H), 3.12 (m, 4H), 2.50-3.5 (m, 2H), 2.0-2.5 (m, 2H), 1.83 (m, 4H); MS: m/e=421.9;

3-cyclohexyl-*N*-[1*S*-(5-nitrobenzooxazol-2ylcarbonyl)-3-phenylpropyl]propionamide (Compound 41); MS (ESI) m/z = 464 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.95 (m, 2H), δ 1.22 (m, 4H), δ 1.51 (m, 1H), δ 1.65 (m, 6H), δ 2.20 (m, 3H), δ 2.51 (m, 1H), δ 2.80 (m, 2H), δ 5.67 (m, 1H), δ 6.17 (d, J = 6 Hz, 1H), δ 7.09 - 7.35 (m, 5H), δ 7.77 (d, J = 6Hz, 1H), δ 8.50 (d, J = 6 Hz, 1H), δ 8.77 (s, 1H), ($C_{26}H_{29}N_3O_5$);

methyl 2-[2*S*-(3-cyclohexylpropionylamino)-4-phenylbutyryl]benzooxazole-6-carboxylate (Compound 42); MS (ESI) m/z = 477 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.95 (m, 2H), δ 1.22 (m, 4H), δ 1.51 (m, 1H), δ 1.65 (m, 6H), δ 2.23 (m, 3H), δ 2.50 (m, 1H), δ 2.77 (m, 2H), δ 4.00 (s, 3H), δ 5.78 (m, 1H), δ 6.27 (d, J = 6 Hz, 1H), 7.15 - 7.35 (m, 5H), δ 7.98 (d, J = 6 Hz, 1H), δ 8.22 (d, J = 6Hz, 1H), δ 8.39 (s, 1H), ($C_{28}H_{32}N_2O_5$);

N-[1*S*-(5-chlorobenzooxazol-2-ylcarbonyl)-3-phenylpropyl]-3-cyclohexy]propionamide (Compound 43); MS (ESI) m/z = 453 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.95 (m, 2H), δ 1.22 (m, 4H), δ 1.53 (m, 2H), δ 1.65 (m, 5H), δ 2.20 (m, 3H), δ 2.50 (m, 1H), δ 2.77 (m, 2H), δ 5.74 (m, 1H), δ 6.20 (d, J = 6 Hz, 1H), δ 7.09 - 7.35 (m, 5H), δ 7.60 (m, 2H), δ 7.90 (s, 1H), ($C_{26}H_{29}ClN_2O_3$);

benzyl 1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylsulfamoylmethyl)-3-methylbutylcarbamate (Compound 44); ^{1}H NMR ($CDCl_3$): 7.92 (d, J=7.7Hz, 1H), 7.64 (m, 1H), 7.57 (m, 1H), 7.50 (m, 1H), 7.21-7.34 (m, 10H), 6.30 (dj=9.2Hz, 1H), 5.34 (m, 1H), 5.11 (m, 1H), 4.91 (d,J=9.6Hz, 1H), 4.51 (m, 1H), 3.11 (m, 2H), 2.89 (m, 2H), 2.50 (m, 1H), 2.20 (m, 1H), 1.70 (m, 1H), 1.5 (m, 1H), 1.23-1.46 (m, 1H), 0.;92 (t,J=7.4Hz, H); MS: m/e=578.1;

N-{1*S*-[1*S*-(benzooxazol-2-ylcarbonyl)-3 phenylpropylsulfamoylmethyl]-3-methylbutyl}acetamide (Compound 45); ^{1}H NMR ($CDCl_3$): 7.89 (d,J=7.7Hz, 1H), 7.62 (m, 1H), 7.55 (m, 1H), 7.49 (m, 1H), 7.18-7.30 (m, 5H), 6.7 (d, J=8.9Hz, 1H), 5.61 (d, J=9.4Hz, 1H), 5.34 (m, 1H), 4.86 (m, 1H), 3.06 (m, 2H), 2.90 (t, J=7.7Hz,. 2H), 2.24 (m, 1H), 2.22 (m, 1H), 2.04 (s, 3H), 1.66 (m, 1H), 1.48 (m, 1H), 1.38 (m, 1H), 0.91 (t, J=6.2Hz, 6H); MS: m/e=486.1;

benzyl 1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylsulfamoylmethyl)-3-methylbutylcarbamate (Compound 46) ^{1}H NMR ($CDCl_3$): 7.9 (m, 1H), 7.60 (m, 1H), 7.58 (m, 1H), 7.5 (m, 1H), 7.75-7.4 (m, 10H), 5.85 (m, 1H), 5.0-5.4 (m, 3H), 4.2 (m, 1H), 3.15-3.35 (m, 2H), 2.65-2.85 (m, 2H), 2.45 (m, 1H), 2.15 (m, 1H), 1.9 (m, 1H), 1.4-1.7 (m, 3H), 0.9 (m, 6H); MS: m/e=578.1; and

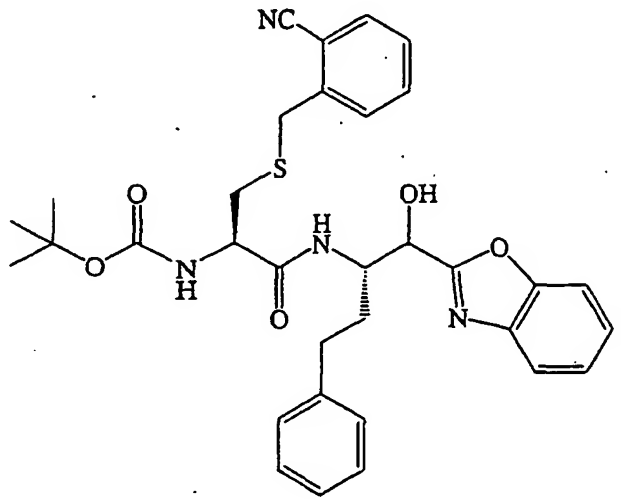
N-[1-(1-benzooxazol-2-ylcarbonyl-3-phenylprogylsulfamoylmethyl)-3-methylbutyl]acetamide (Compound 47) ^{1}H NMR ($CDCl_3$): 7.9 (m, 1H), 7.65 (m, 1H), 7.61 (m, 1H), 7.60 (m, 1H), 7.18-7.30 (m, 5H), 6.0 (m, 1H), 5.85 (m, 1H), 5.28 (m, 1H), 4.50 (m, 1H), 3.20 (m, 1H), 2.85 (m, 1H), 2.70 (m, 1H), 1.8-2.2 (m, 2H), 1.95 (S, 3H), 1.35-1.70 (m, 2H), 0.9 (m, 6H); MS: m/e=486.0.

EXAMPLE 3

tert-Butyl 1R-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl-2-(2-cyanobenzylsulfanly)ethylcarbamate

(Compound 48)

[0162]



[0163] A solution of 2*R*-*tert*-butoxycarbonylamino-3-(2-cyanobenzylsulfanyl)propionic acid (336 mg), 2*S*-amino-1-benzooxazol-2-yl-4-phenylbutan-1-ol (282mg), 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride (211 mg) and 1-hydroxybenzotriazole (197 mg) in dichloromethane (20 mL) was treated with *N*-methylmorpholine (2.2 mL). The reaction mixture was stirred 0.5 hour and then concentrated by evaporation. The residue was dissolved in ethyl acetate (40 mL) and the solution was washed sequentially with water (20 mL), 1N hydrochloric acid (30 mL), a saturated sodium bicarbonate solution (30 mL) and then brine (30mL), dried over magnesium sulfate and concentrated by evaporation. The residue was subjected to flash column chromatography on silica eluting with diethyl ether to provide *tert*-butyl 1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-(2-cyanobenzylsulfanyl)ethylcarbamate as an off white solid. MS: 601 $[MH]^+$.

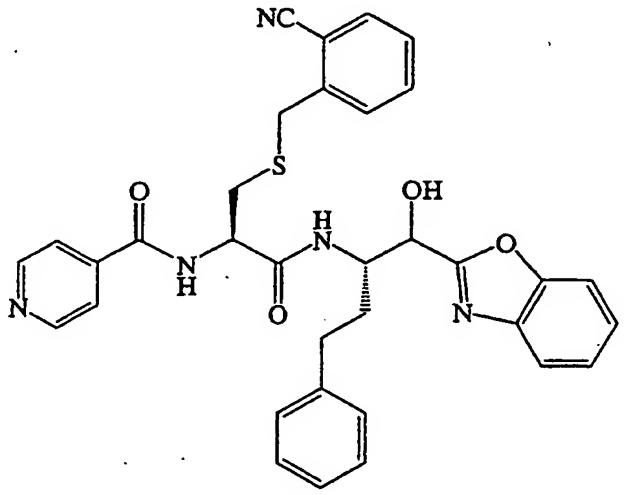
[0164] Proceeding as in Example 3 provided *tert*-butyl 1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfanylethylcarbamate (Compound 49), MS: 576 $[MH]^+$.

EXAMPLE 4

N-[1*R*-(2-Benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-(2-cyanobenzylsulfanyl)ethyl]isonicotinamide

(Compound 50)

[0165]



[0166] A solution of 3-(2-cyanobenzylsulfanyl)-2*R*-(pyrid-4-ylcarbonyl)aminopropionic acid (425 mg), provided as in Reference 2, 2S-amino-1-benzooxazol-2-yl-4-phenylbutan-1-ol (356 mg) and HATU (356 mg) in dimethylformamide (40 mL) was treated with diisopropylamine (0.239 mL). The reaction mixture was stirred for 16 hours at room temperature then concentrated by evaporation. The residue was dissolved in ethyl acetate and the solution was washed with saturated sodium bicarbonate solution, dried over magnesium sulfate and then concentrated by evaporation. The residue was subjected to flash column chromatography on silica eluting with ethyl acetate to provide *N*-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-(2-cyanobenzylsulfanyl)ethyl]isonicotinamide (216 mg) as a gum. MS: 606 $[MH]^+$. HPLC: R_T= 13.20 minutes.

[0167] Proceeding as in Example 4 provided 9*H*-fluoren-9-ylmethyl 1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-cyclohexylethylcarbamate (Compound 51);

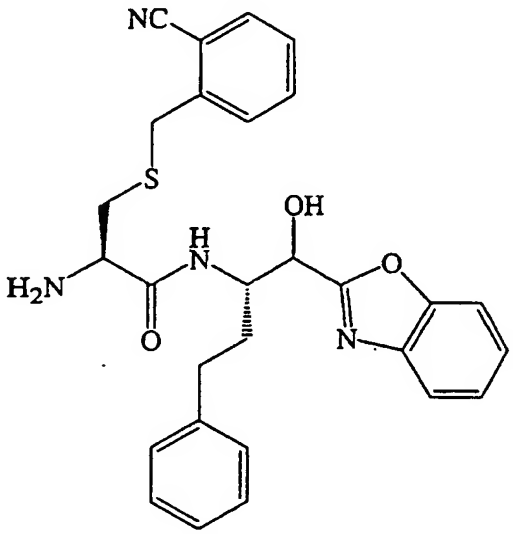
[0168] 9*H*-fluoren-9-ylmethyl 1*S*-[2-benzooxazol-2-yl-2-(*tert*-butyldimethylsilanyloxy)-1*S* phenethylethylcarbamoyl]-2-cyclohexylethylcarbamate (Compound 52), MS: 772 $[MH]^+$.

EXAMPLE 5

2*R*-Amino-*N*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-(2-cyanobenzylsulfanyl)-propionamide hydrochloride

(Compound 53)

[0169]



[0170] A solution *tert*-butyl 1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-(2-cyanobenzylsulfanyl)ethylcarbamate (145 mg), provided as in Example 3, in dioxane (20 mL) was treated with hydrogen chloride, bubbling the gas through the solution for 30 minutes. The reaction mixture was concentrated by evaporation and the residue was triturated with diethyl ether to provide 2*R*-amino-*N*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-(2-cyanobenzylsulfanyl)propionamide hydrochloride (117 mg) as a an off-white solid. MS: 537 $[MH]^+$.

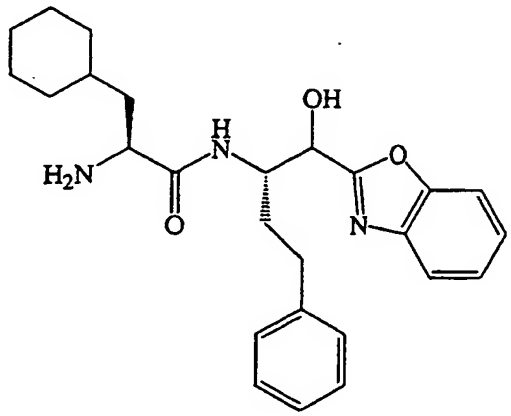
[0171] Proceeding as in Example 5 provided 2*R*-amino-*N*-[2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-benzylsulfonylpropionamide hydrochloride (Compound 54), MS: 508 $[MH]^+$.

EXAMPLE 6

2*S*-Amino-*N*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-cyclohexylpropionamide

(Compound 55)

[0172]

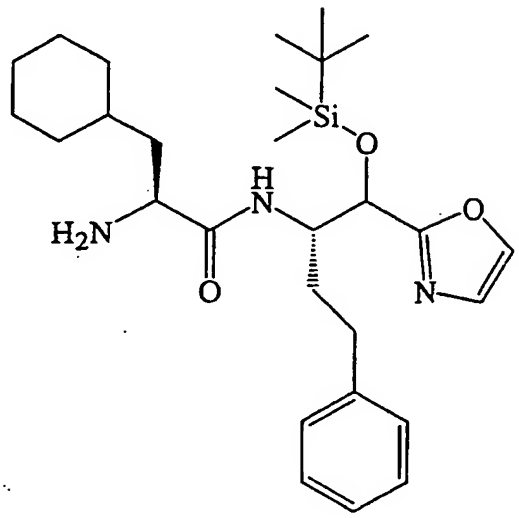


[0173] A solution of 9*H*-fluoren-9-ylmethyl 1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-cyclohexylethylcarbamate (165 mg), provided as in Example 4, in dichloromethane (30 mL) was treated with tris(2-aminoethyl)amine bound to polysterene beads (4.48 g). The mixture was stirred at room temperature for 48 hours and then filtered. The resin was washed four times with dichloromethane (20 mL) and the combined filtrates were concentrated under reduced pressure to provide 2*S*-amino-*N*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-cyclohexylproprionamide (147 mg) as a colourless oil.

EXAMPLE 7

2*S*-Amino-*N*-(2-benzooxazol-2-yl-2-(*tert*-butyldimethylsilanyloxy)-1*S*-phenethylethyl]-3-cyclohexylpropionamide (Compound 56), a protected compound of Formula I

[0174]



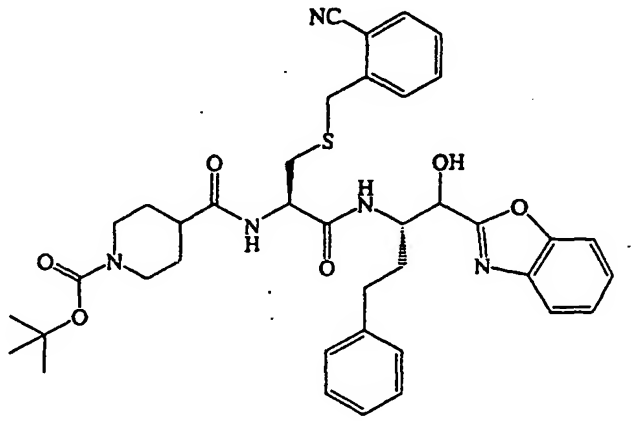
[0175] A solution of 9*H*-fluoren-9-ylmethyl 1*S*-[2-benzooxazol-2-yl-2-(*tert*-butyldimethylsilanyloxy)-1*S*-phenethylethylcarbamoyl]-2-cyclohexylethylcarbamate (1.48 g), provided as in Example 4, in dichloromethane (50 mL) was treated with tris-(2-aminoethyl)amine (14.4 mL). The reaction mixture was stirred for 75 minutes and then additional dichloromethane was added (50 mL). The mixture was washed sequentially with brine (50 mL x4) and a pH 5.3 buffer (50 mL x3), dried over magnesium sulphate and concentrated to provide 2*S*-amino-*N*-[2-benzooxazol-2-yl-2-(*tert*-butyldimethylsilanyloxyl-1*S*-phenethylethyl]-3-cyclohexylpropionamide as an orange oil.

EXAMPLE 8

tert-Butyl 4-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl]-2-(2-cyanobenzylsulfanyl) ethylcarbamoylpiperidine-1-carboxylate

(Compound 57)

[0176]



[0177] A solution of 2*R*-amino-*N*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-(2-cyanobenzylsulfanyl)propionamide hydrochloride (170 mg), provided as in Example 5, in dimethylformamide (7 mL) was treated with 1-*tert*-butoxycarbonylpiperidine-4-carboxylic acid tetrafluorophenyl ester *tert*-butyl ester on resin (excess), prepared according to the procedure described in International Patent Application No. WO99/67228, and triethylamine (0.053mL). The suspension was agitated for 16 hours, then filtered, and the filtrate was washed with dimethylaformamide and then concentrated by evaporation. The residue was subjected to flash column chromatography on silica eluting with ethyl acetate to give *tert*-butyl 4-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl-2-(2-cyanobenzylsulfanyl)ethylcarbamoylpiperidine-1-carboxylate (95mg) as a gum.
MS: 712 $[MH]^+$.

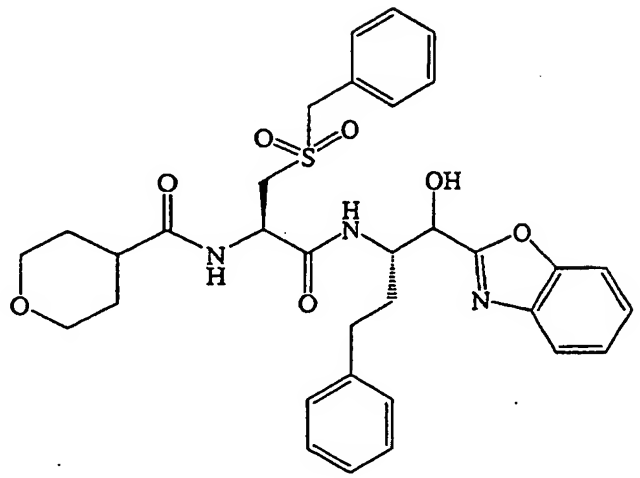
[0178] Proceeding as in Example 8 provided benzyl 4-[1S-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-cyclohexylethylcarbamoyl]piperidine-1-carboxylate (Compound 58), MS: 681 $[M]^+$.

EXAMPLE 9

N-[1*R*-(2-Benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfonylethyl]-tetrahydropyran-4-carboxamide

(Compound 59)

[0179]



[0180] A mixture of 2*R*-amino-*N*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-benzylsulfonylpropionamide hydrochloride (0.3 g), prepared as in Example 5, tetrahydropyran-4-carboxylic acid (0.072 g), 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride (0.116 g) and 1-hydroxybenzotriazole (0.112 g) in dichloromethane (20 mL) was treated with 4-*N*-methylmorpholine (0.12 mL). After stirring at room temperature for 4 hours the reaction mixture was left to stand 16 hours and then concentrated by evaporation. The residue was treated with dichloromethane (50 mL) and the mixture was washed sequentially with 1N hydrochloric acid solution (5 mL), saturated sodium bicarbonate solution (5 mL) and brine (5 mL), dried over magnesium sulfate and then concentrated by evaporation. The residue was subjected to flash column chromatography on silica eluting with ethylacetate to provide *N*-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfonylethyl]-tetrahydropyran-4-carboxamide (66 mg) as a cream solid. MS: 618 $[MH]^+$.

[0181] Proceeding as in Example 9 provided the following compounds of Formula I:

N-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfonylethyl]-nicotinamide (Compound 60), MS: 613 $[MH]^+$;

N-[1*R*-(2-benzooxazo]-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfonylethyl]pyrazine-2-carboxamide (Compound 61), MS: 614 $[MH]^+$;

4-[1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-cyclohexylethylcarbamoyl]piperidine-1-carboxylate (Compound 62); and

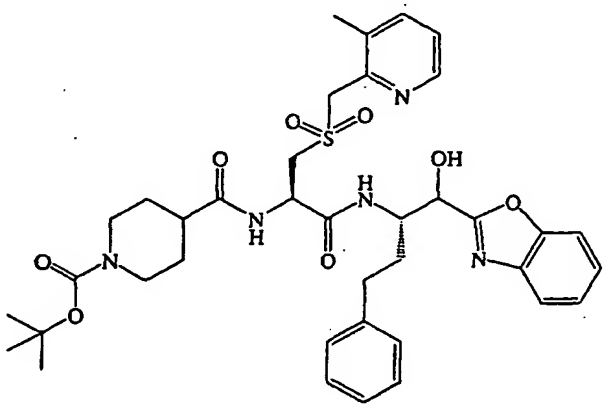
N-[1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-cyclohexylethyl]-isonicotinamide (Compound 63).

EXAMPLE 10

tert-Butyl 4-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl]-2-(3-methylpyrid-2-ylmethylsulfonyl) ethylcarbamoyl]piperidine-1-carboxylate

(Compound 64)

[0182]



[0183] A solution of 2*R*-amino-*N*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-(3-methylpyrid-2-ylmethylsulfonyl)propionamide (178 mg), HATU (137 mg) and 1-*tert*-butoxycarbonylpiperidine-4-carboxylic acid (69 mg) in dimethylformamide (10 mL) was treated with *N,N*-diisopropylethylamine (0.174 mL). The reaction mixture was stirred for 9 hours and then concentrated by evaporation. The residue was dissolved in ethyl acetate and the solution was washed with saturated sodium bicarbonate solution, dried over magnesium sulfate and then concentrated by evaporation. The residue was subjected to flash column chromatography on silica eluting with ethyl acetate to provide *tert*-butyl4-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl]-2-(3-methylpyrid-2-ylmethylsulfonyl)ethylcarbamoyl]piperidine-1-carboxylate (81 mg). MS: 734 $[MH]^+$.

[0184] Proceeding as in Example 10 provided the following compounds of Formula I:

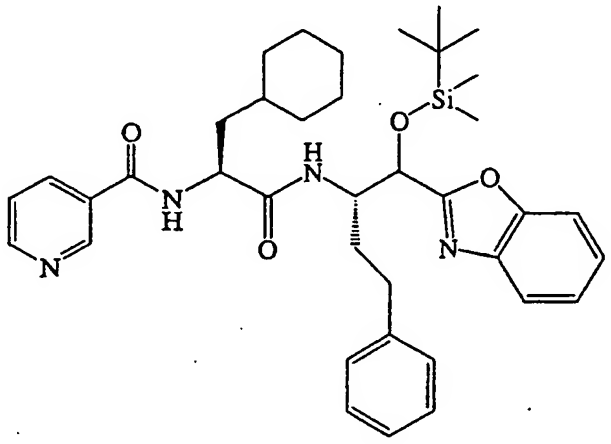
tetrahydropyran-4-yl 1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfanylethylcarbamate (Compound 65);
N-[1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-cyclohexylethyl]tetrahydropyran-4-carboxamide (Compound 66), MS: 548 $[M]^+$; and
N-[1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-cyclohexylethyl]-6-hydroxynicotinamide (Compound 67).

EXAMPLE 11

N-[2-Benzooxazol-2-yl-2-(*tert*-butyldimethylsilanyloxy)-1*S*-phenethylethyl]-3-cyclohexyl-2*S*-(3-pyrid-3-ylureido) propionamide

(Compound 68), a protected compound of Formula I

[0185]



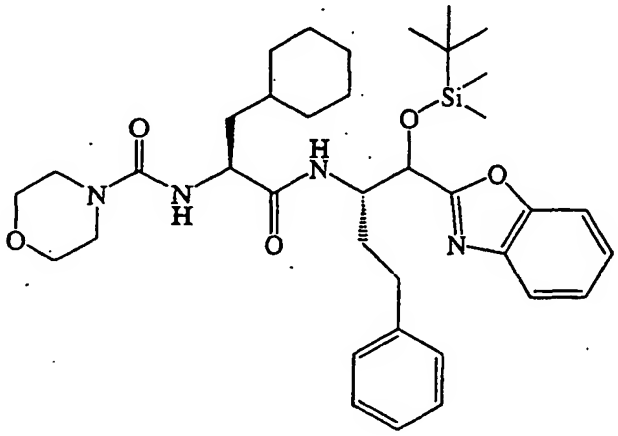
[0186] A solution of 2*S*-amino-*N*-[2-benzooxazol-2-yl-2-(*tert*-butyldimethylsilanyloxy)-1*S*-phenethylethyl]-3-cyclohexylpropionamide (200.1 mg), provided as in Example 7, in dichloromethane (10 mL) was treated with 3-pyridyl isocyanate (48 mg). The mixture was stirred at room temperature for 16 hours and the solvent evaporated under reduced presssure. The residue was subjected to flash column chromatography on silica eluting with a mixture of pentane and ethylacetate (2:1, v/v) to provide *N*-[2-benzooxazol-2-yl-2-(*tert*-butyldimethylsilanyloxyl-1*S*-phenethylethyl]-3-cyclohexyl-2*S*-(3-pyrid-3-ylureido)propionamide (172 mg) as a colorless oil.

EXAMPLE 12

N-{1*S*-[2-Benzooxazol-2-yl-2-(*tert*-butyldimethylsilanylox)-1*S*-phenethylethylcarbamoyl]-2-cyclohexylethyl} morpholine-4-carboxamide

(Compound 69), a protected compound of Formula I

[0187]



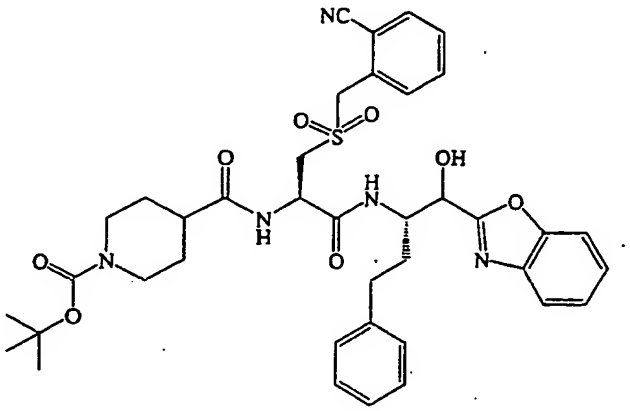
[0188] A solution of 2*S*-amino-*N*-[2-benzooxazol-2-yl-2-(*tert*-butyldimethylsilanyloxy)-1*S*-phenethylethyl)-3-cyclohexylpropionamide (200 mg), provided as in Example 7, in dichloromethane (8 mL) was treated with 4-morpholinecarbonyl chloride (0.094 mL) and triethylamine (0.112 mL). The solution was stirred at room temperature for 20 hours. The solvent was evaporated under reduced pressure and the residue was purified by flash chromatography on silica eluting with a mixture of pentane and ethylacetate (2: 1, v/v) to provide *N*-{1*S*-[2-benzooxazol-2-yl-2-(*tert*-butyldimethylsilanyloxy)-1*S*-phenethylethylcarbamoyl]-2-cyclohexylethyl}morpholine-4-carboxamide (143 mg) as a white solid. MH^+ 663.

EXAMPLE 13

tert-butyl 4-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl]-2-(2-cyanobenzylsulfonyl) ethylcarbamoylpiperidine-1-carboxylate

(Compound 70)

[0189]



[0190] A solution of *tert*-butyl 4-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl]-2-(2-cyanobenzylsulfanyl)ethylcarbamoylpiperidine-1-carboxylate (95 mg), provided as in Example 8, in methanol (8 mL) was treated with a solution of OXONE® (246 mg) in water (8 mL). After stirring at room temperature for 10 hours the methanol was distilled under reduced pressure and the remaining aqueous phase was extracted four times with ethyl acetate (20mL). The combined extracts were dried over magnesium sulfate and then concentrated by evaporation. The residue was subjected to flash column chromatography on silica eluting with ethyl acetate to give the *tert*-butyl4-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl]-2-(2-cyanobenzylsulfonyl)ethylcarbamoylpiperidine-1-carboxylate (35 mg) as a gum. MS: 744 $[MH]^+$.

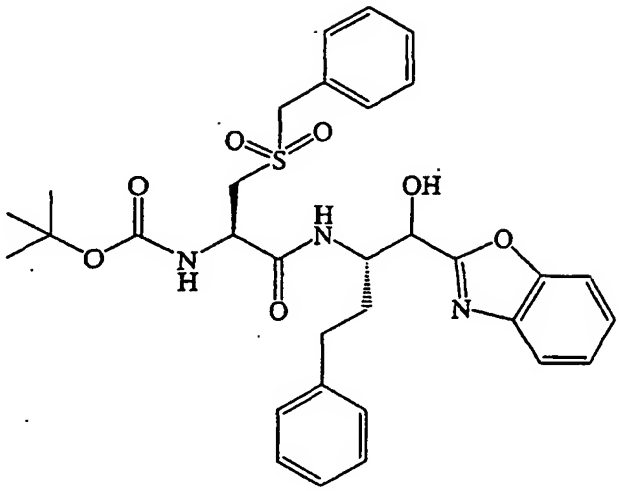
[0191] Proceeding as in Example 13 provided *N*-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-(2-cyanobenzylsulfonyl)ethyl]isonicotinamide (Compound 71), HPLC: R_T= 12.89 minutes.

EXAMPLE 14

tert-Butyl 1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfonylethylcarbamate

(Compound 72)

[0192]



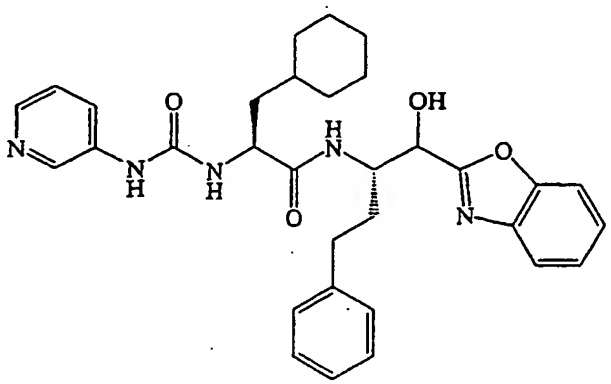
[0193] A solution of *tert*-butyl 1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfanylethylcarbamate (3.62 g), provided as in Example 3, in dichloromethane (174 mL) was treated with *meta*-chloroperbenzoic acid (6.9 g). After stirring at room temperature for 5 hours the reaction mixture was diluted with dichloromethane (100 mL), washed sequentially with a saturated sodium bicarbonate solution (100 mL) and brine (100 mL), dried over magnesium sulfate and then concentrated by evaporation. The residue was subjected to flash column chromatography on silica eluting with a mixture of pentane and ethylecetate (1:1, v/v) to provide *tert*-butyl 1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfonylethylcarbamate (0.95 g) as a yellow solid. MS: 608 $[MH]^+$.

[0194] Proceeding as in Example 14 provided *N*-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-pyrid-3-ylmethylsulfonylethyl]pyrazine-2-carboxamide (Compound 73).

EXAMPLE 15

N-(2-Benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-cyclohexyl-2*S*-(3-pyrid-3-ylureido)propionamide (Compound 74)

[0195]



[0196] A solution of *N*-[2-benzooxazol-2-yl-2-(*tert*-butyldimethylsilanyloxy)-1*S*-phenethylethyl]-3-cyclohexyl-2*S*-(3-pyrid-3-ylureido)propionamide (172 mg) in tetrahydrofuran (5 mL), provided as in Example 11, under an inert atmosphere at room temperature was treated with a solution of tetrabutylammoniumfluoride in 1M tetrahydrofuran (0.4 mL). After stirring at room temperature for 90 minutes, the solvent was distilled under reduced pressure. The residue was subjected to flash column chromatography on silica eluting with a mixture of ethylacetate and pentane (5:1, v/v) to provide *N*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethly)-3-cyclohexyl-2*S*-(3-pyrid-3-ylureido)propionamide (108 mg) as a white solid.

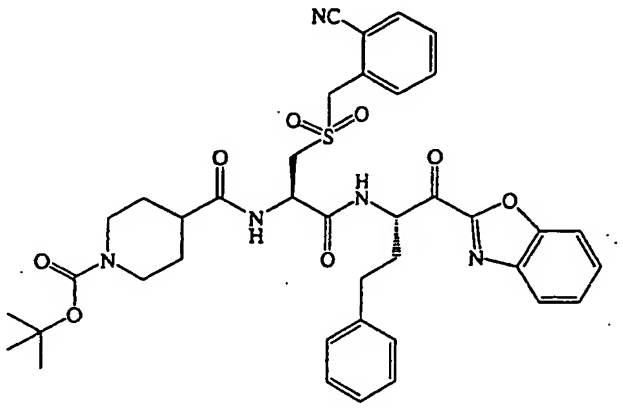
[0197] Proceeding as in Example 15 provided *N*-[1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-cyclohexylethyl]morpholine-4-carboxamide (Compound 75).

EXAMPLE 16

tert-Butyl 4-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-cyano-benzylsulfonyl)ethylcarbamoyl]piperidine-1-carboxylate

(Compound 76)

[0198]



[0199] A solution *tert*-butyl 4-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl]-2-(2-cyanobenzylsulfonyl)ethylcarbamoylpiperidine-1-carboxylate (35 mg, prepared as in Example 13, in dichloromethane (10 mL) was treated with Dess-Martin reagent (60 mg). The reaction mixture was stirred at room temperature for 5 hours, then washed with sodium thiosulfate in saturated sodium bi-carbonate solution, dried over magnesium sulfate and then concentrated by evaporation. The residue was subjected to flash column chromatography on silica eluting with a mixture of ethyl acetate and pentane (1:1, v/v) to give *tert*-butyl 4-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-cyanobenzylsulfonyl)ethylcarbamoyl]piperidine-1-carboxylate (26 mg) as a gum. MS: 742 $[MH]^+$.

[0200] Proceeding as in Example 16 provided the following compounds of Formula I:

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]tetrahydroyran-4-carboxamide (Compound 77), m.p. 178-180°C, MS: 618 $[MH]^+$;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]nicotinamide (Compound 78), m.p. 193-195°C, MS: 611 $[MH]^+$;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]pyrazine-2-carboxamide (Compound 79), m.p. 194-196°C. MS: 612 $[MH]^+$;

tert-butyl 4-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpronylcarbamoyl)-2-cyclohexylethylcarbamoyl]piperidine-1-carboxylate (Compound 80);

tert-butyl 4-[1*S*-(1-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(6-methylpyrid-2-ylmethylsulfonyl) ethylcarbamoyl]piperidine-1-carboxylate (Compound 81), MS: 732 $[MH]^+$, HPLC: R_T = 15.18 minutes;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropyl]carbamoyl)-2-(2-cyanobenzylsulfonyl)ethyl]isonicotinamide (Compound 82), m.p. 204-206°C, MS: 636 $[MH]^+$;

tetrahydropyran-4-yl 1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethylcar-

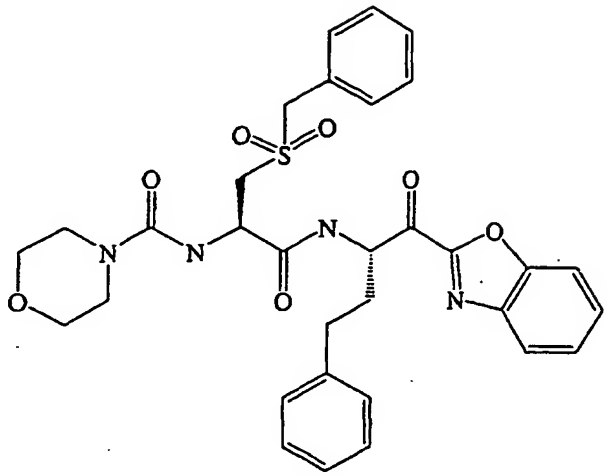
bamate (Compound 83), m.p. 93°C (with decomposition), MS: 634 $[MH]^+$;
benzyl 4-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-cyclohexylethylcarbamoyl]piperidine-1-carboxylate (Compound 84), MS: 677 $[M]^-$;
N-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-3-cyclohexyl-2*S*-(3-pyrid-3-ylureido)propionamide (Compound 85), MS: 554 $[M]^+$;
N-(1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-cyclohexylethyl]morpholine-4-carboxamide (Compound 86), MS: 547 $[MH]^+$;
N-(1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-cyclohexylethylisonicotinamide (Compound 87), MS: 537 $[M]^-$;
N-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-cyclohexylethyl]tetrahydropyran-4-carboxamide (Compound 88), MS: 546 $[M]^+$; and
N-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-cyclohexylethyl]-6-hydroxynicotinamide (Compound 89), MS: 555 $[M]^-$.

EXAMPLE 17

N-[1*R*-(1*S*-Benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide

(Compound 90)

[0201]



[0202] A mixture of *N*-[1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide (7.2 g, 11.6 mmol), prepared as in Example 1, and Dess-Martin periodinane (9.87 g, 23.3 mmol) in dichloromethane (57 mL) was stirred at room temperature for 1 hour and then diluted with a solution of 0.26 M sodium thiosulfate in saturated sodium bicarbonate. The dilution was extracted with ethyl acetate and the extract was filtered. The filtrate was concentrated to provide *N*-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide (2.33 g) as an orange/tan oil. The solids collected from the filtration were taken up into dichloromethane (700 mL) and the mixture was washed sequentially with water and saturated sodium bicarbonate solution, dried and concentrated to provide *N*-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide (4.2 g) as a white powder. ^{1}H NMR (DMSO-d6) 8.024 (d, J=6.68Hz, 1H), 7.9787 (d, J=7.92Hz, 1H), 7.8857 (d, J=8.16Hz, 1H), 7.6471 (td, J=8.41, 0.99 Hz, 1H), 7.5455 (td, J=8.16, 1.24Hz, 1H), 7.3806 (s, 5H), 7.2479 (m, 5H), 7.1210 (d, J=4.53Hz), 1H, 5.2578 (m, 1H), 4.7395 (m, 1H), 4.5059 (s, 2H), 3.5342 (m, 4H), 3.4082 (m, 2H), 3.30 (m, 4H (+water)), 2.6963 (m, 2H), 2.2768 (m, 1H), 2.0497 (m, 1H). MS (M^+1) 619.2.

[0203] Proceeding as in Example 17 provided the following compounds of Formula I:

N-[1*R*-(2-benzooxazol-2-yl-1,1-dimethyl-2-oxoethylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide (Compound 91); ^{1}H NMR: (DMSO)9.26(s, 1H), 7.79 (d, J=8Hz, 1H), 7.73 (d, J=8Hz, 1H), 7.56 (t, J=8Hz, 1H), 7.47 (t, J=8Hz, 1H), 7.36-7.25 (m, 5H), 6.70 (d, J=8Hz, 1H), 4.67 (m, 1H), 4.39 (d, J=14Hz, 1H), 4.32 (d, J=14Hz, 1H),

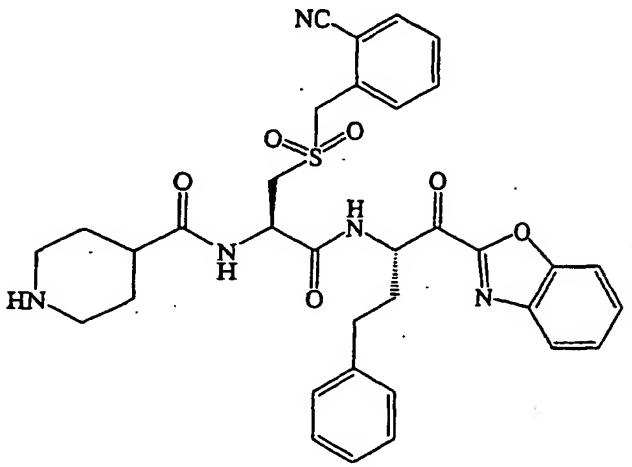
3.49-3.00 (m, 10H), 1.56 (s, 3H), 1.51 (s, 3H); MS: (M^++1) 543;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(3.5-dimethylisoxazol-4-ylmethylsulfonyl)ethyl]morpholine-4-carboxamide (Compound 92); ^{1}H NMR: (DMSO) 8.66 (d, J=6.6Hz, 1H), 7.99 (d, J=8Hz, 1H), 7.88 (d, J=8Hz, 1H), 7.62 (t, J=8Hz, 1H), 7.52 (t, J=8Hz, 1H), 7.02 (d, J=7.7Hz, 1H), 5.24 (m, 1H), 4.76 (m, 1H), 4.39 (d, J=14Hz, 1H), 4.27 (d, J=14Hz, 1H), 3.63-3.20 (m, 10H), 2.33 (s, 3H), 2.15 (s, 3H), 1.94 (m, 1H), 1.69 (m, 1H), 1.40-1.22 (m, 4H), 0.84 (t, J=6.7Hz, 3H); MS: (M^++1) 590; and
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl)pentylcarbamoyl)-2-(3,5-dimethylisoxazol-4-ylmethylsulfonylethyl]isonicotinamide (Compound 93); ^{1}H NMR: (DMSO) 9.23 (d, J=8Hz, 1H), 8.87 (d, J=7Hz, 1H), 8.71 (m, 2H), 7.98 (d, J=8Hz, 1H), 7.87 (d, J=8Hz, 1H), 7.70 (m, 2H), 7.62 (t, J=8Hz, 1H), 7.51 (t, J=8Hz, 1H), 5.28 (m, 1H), 5.10 (m, 1H), 4.44 (d, J=14Hz, 1H), 4.37 (d, J=14Hz, 1H), 3.80-3.52 (m, 2H), 2.33 (s, 3H), 2.14 (s, 3H), 1.95 (m, 1H), 1.69 (m, 1H), 1.40-1.22 (m, 4H), 0.82 (t, J=6.7Hz, 3H); MS: (M^++1) 582.

EXAMPLE 18

N-[1*R*-(1*S*-Benzooxazol-2-ylcarbonyl-3-phenylpronylcarbamoyl)-2-(2-cyanobenzylsulfonyl)ethyl)ethyl]piperidine-4-carboxamide

(Compound 94)

[0204]



[0205] A solution of *tert*-butyl 4-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-cyanobenzylsulfonyl)ethylcarbamoyl]piperidine-1-carboxylate (26 mg), provided as in Example 16, in ethyl acetate (10 mL) was treated with hydrogen chloride, bubbling the gas through the solution for 3 minutes. A white solid formed which was filtered and dried under reduced pressure to provide *N*-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-cyanobenzylsulfonyl)ethyl]piperidine-4-carboxamide (19 mg) as a solid, m.p. = 155-157°C. MS: 678 $[MH]^+$.

[0206] Proceeding as in Example 18 provided *N*-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-cyclohexylethyl]piperidine-4-carboxamide hydrochloride (Compound 95), MS: 634 $[MH]^+$; and

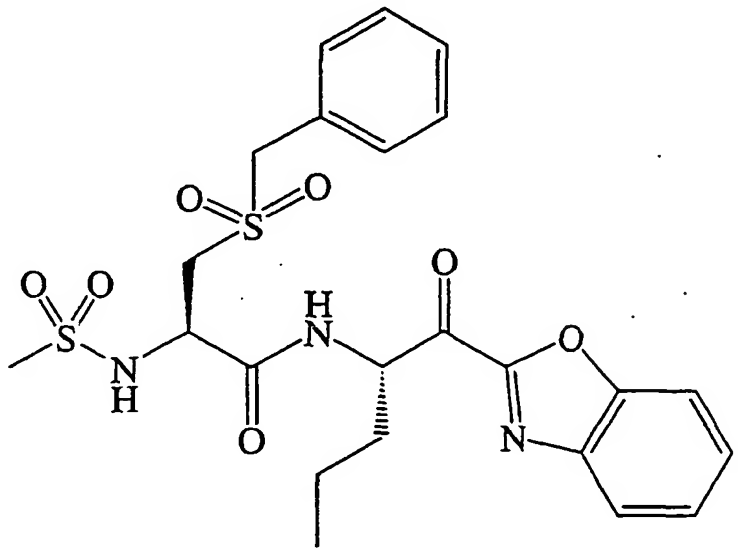
[0207] *N*-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(6-methylpyrid-2-ylmethylsulfonyl)ethyl] piperidine-4-carboxamide (Compound 96), MS: 632 $[MH]^+$, HPLC: R_T = 12.05 minutes.

EXAMPLE 19

N-(1*S*-Benzooxazol-2-ylcarbonylbutyl)-2*R*-methylsulfonylamino-3-benzylsulfonylpropionamide

(Compound 159)

[0208]



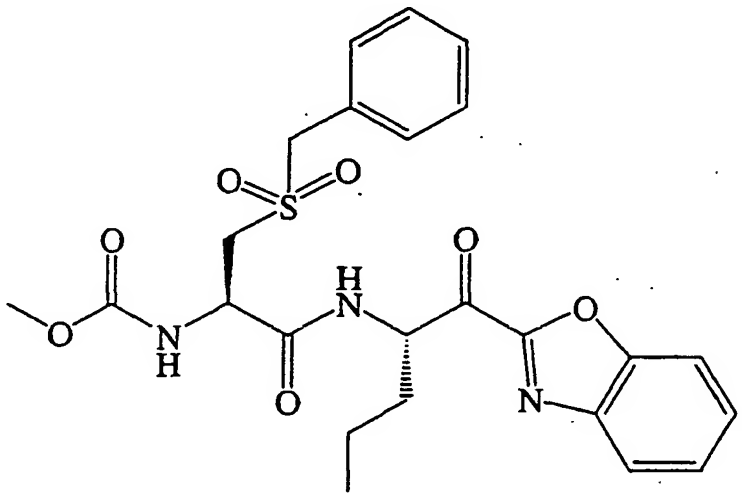
[0209] A solution of (*R*)-2-(2-methylsulfonylacetylamino)-3-benzylsulfonylpropionic acid (212 mg, 0.66 mmol), (*S*)-2-amino-1-benzooxazol-2-ylpentan-1-ol (150 mg, 0.66 mmol), EDCI (165 mg, 0.858 mmol) and HOBT (110 mg, 0.726 mmol) in methylene chloride (3 mL) was stirred at room temperature for 2 hours, sequentially washed with hydrochloric acid, sodium bicarbonate solution and brine and then concentrated. The residue was dissolved in dichloromethane and the solution was treated with Dess-Martin reagent (340 mg, 0.8 mmol) for 1 hour. The mixture was stirred with a sodium thiosulfate/sodium bicarbonate solution and the mixture was extracted with ethyl acetate. The extract was washed sequentiall with dilute hydrochloric acid, sodium bicarbonate and brine, dried ($MgSO_4$) and then concentrated to provide *N*-(1*S*-benzooxazol-2-ylcarbonylbutyl)-2*R*-methylsulfonylamino-3-benzylsulfonyl]propionamide (49 mg, 0.09 mmol). ^1H NMR (DMSO): 9.0 (d,J = 7Hz, 1H), 8.0 (d,J = 8Hz, 1H), 7.90 (d,J = 9Hz, 1H), 7.66 (t,J = 8Hz, 1H), 7.55 (t,J =9Hz, 1H), 7.39 (s, 5H), 5.32 (m, 1H), 4.55 (m, 3H), 3.35 (m, 3H), 2.95 (s, 3H), 1.94 (m, 1H), 1.71 (m, 1H), 1.45 (m, 2H), 0.92 (t, J=8Hz, 3H); MS: m/e=522.03.

EXAMPLE 20

Methyl 1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl-2-benzylsulfonylethylcarbamate

(Compound 158)

[0210]



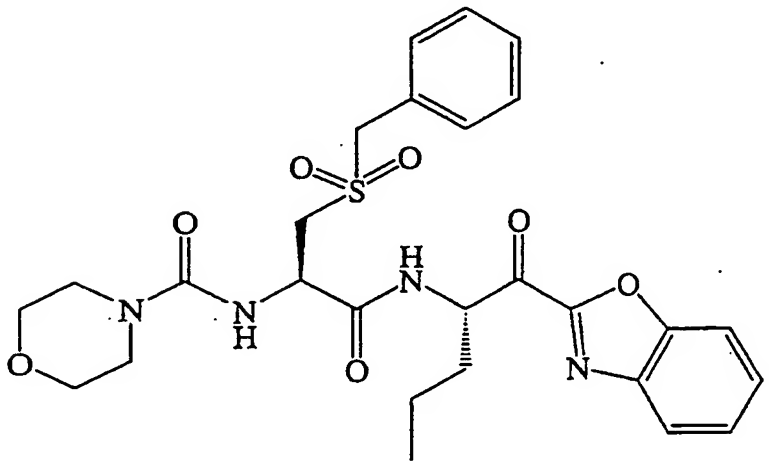
[0211] A solution of (*R*)-2-(2-methoxycarbonylamino)-3-benzylsulfonylpropionic acid (200 mg, 0.66 mmol), (*S*)-2-amino-1-benzooxazol-2-ylpentan-1-ol (150 mg, 0.66 mmol), EDCI (165 mg, 0.858 mmol) and HOBT (110 mg, 0.726 mmol) in methylene chloride (3 mL) was stirred at room temperature for 2 hours, sequentially washed with hydrochloric acid, sodium bicarbonate solution and brine and then concentrated. The residue was treated with Dess-Martin reagent (340 mg, 0.8 mmol) in dichloromethane (4 mL) for 1 hour. The mixture was stirred with a sodium thiosulfate/sodium bicarbonate solution and the mixture was extracted with ethyl acetate. The extract was washed sequentially with dilute hydrochloric acid, sodium bicarbonate and brine, dried ($MgSO_4$) and then concentrated. The residue was heated with ethyl acetate and then treated with *tert*-butyloxymethyl. The mixture was let stand for approximately 12 hours and then cooled in an ice bath. Resulting solids were collected by filtration and washed with cold ethyl acetate to provide methyl 1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-benzylsulfonylethylcarbamate (133 mg, 0.26 mmol). ^{1}H NMR (DMSO): 8.77 (d,J =7Hz, 1H), 8.01 (d,J = 9Hz, 1H), 7.90 (d,J = 9Hz, 1H), 7.6 (m, 2H), 7.55 (t,J=9Hz, 1H), 7.39 (s, 5H), 5.3 (m, 1H), 4.68 (m, 1H), 4.48 (s, 2H), 3.55 (s, 3H), 3.52-3.4 (m, 1H), 3.3 (m, 1H), 1.92 (m, 1H), 1.73 (m, 1H), 1.42 (m, 2H), 0.91 (t, J=8Hz. 3H); MS: m/e=502.05.

EXAMPLE 21

N-[1*R*-(1*S*-Benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-benzylsulfonylethyl]moroholine-4-carboxamide

(Compound 158)

[0212]



[0213] A solution of (*R*)-2-(2-morpholin-4-ylcarbonylamino)-3-benzylsulfonylpropionic acid (356 mg, 1 mmol), EDCI (240 mg, mmol) and HOBT (178 mg, mmol) in methylene chloride (8 mL) was (*S*)-2-amino-1-benzooxazol-2-ylpentan-1-ol (220 mg, mmol). The mixture was stirred at room temperature for 1.5 hours and then treated with addtional EDCI (80 mg). The mixture was stirred for an additional 0.5 hours and then poured into cold, dilute hydrochloric acid. The mixture was extracted with ethyl acetate (2x) and the extract washed sequentially with aqeous sodium bicarbonate and brine, dried ($MgSO_4$) and concentrated. The residue was dissolved in methylene chloride (8 mL) and the solution was treated with Dess-Martin reagent (544 mg). The mixture was stirred for 1.5 hours and then stirred a sodium thiosulfate/sodium bicarbonate solution for 15 minutes. The mixture was extracted with ethyl acetate (2x) and the extract was washed with brine, dried ($MgSO_4$) and then concentrated. The residue was triturated with ethyl acetate and then hexanes. The mixture cooled in an ice bath and resulting solids were collected and dried to provide *N*-[1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide (408 mg, 73% yield). ^{1}H NMR 300mHz: 8.65 (d,J=7.1H_3, 1H), 8.01 (d, J=8.8H_3, 1H), 7.91 (d, J=9.1H_3, 1H), 7.65 (t, J=8.2H_3, 1H), 7.55 (t, J=9.1H_3, 1H), 7.38 (s, 5H), 7.05 (d, J=9.4H_3, 1H), 5.29 (m, 1H), 4.73 (m, 1H), 4.48 (s, 2H), 3.53 (m, 4H), 3.4-3.2 (m, 6H), 1.94 (m, 1H), 1.73 (m, 1H), 1.42 (m, 2H), 0.91 (t, J=8H_3, 3H),
MS=557.21 M+=556.20.

[0214] Proceeding by methods analogous to those described in this Application provided the following compounds of Formula I:

2*S*-acetylamino-*N*-(2-benzooxazol-2-yl-1*S*-butyl-2-hydroxyethyl)-3-cyclohexyl)propionamide (Compound 97); ^{1}H NMR ($CDCl_3$): 7.67 (d, J=8.0Hz, 1H), 7.53 (d, J=6.0Hz, 1H), 7.34 (m, 2H), 6.64 (d, J=8.1Hz, 1H), 5.99 (d, J=8.1Hz, 1H), 5.03 (m, 1H), 4.39 (m, 2H), 2.02-0.70 (m, 22Hz); MS ESI: MH$^+$ 430;

2*S*-acetylamino-*N*-(1*S*-benzooxazol-2-ylcarbonylpentyl)-3-cyclohexylpropionamide (Compound 98); ^{1}H NMR ($CDCl_3$): 7.93 (d, J=7.5Hz, 1H), 7.67 (d, J=8.1Hz, 1H), 7.54 (t, J=7.2Hz, 1H), 7.46 (t, J=7.8Hz, 1H), 6.78 (d, J=7.2Hz, 1H), 5.91 (d, J=8.4Hz, 1H), 5.63 (m, 1H), 4.59 (m, 1H), 2.09-0.85 (m, 24Hz); MS ESI: MH$^+$ 428;

tert-butyl 1*S*-[1-benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl)-2-cyclohexylethyl]carbamate (Compound 99);

2*S*-acetylamino-*N*-(1-benzooxazol-2-ylcarbonyl)-3-phenylpropyl)-3-cyclohexylpropionamide (Compound 100);

2*S*-acetylamino-*N*-(1-benzooxazol-2-ylcarbonylcyclobutyl)-3-cyclohexylpropionamide (Compound 101);

2*S*-acetylamino-*N*-(1*R*-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-3-cyclohexylpropionamide (Compound 102);

2*S*-acetylamino-*N*-(2-benzooxazol-2-yl-2-hydroxy-1*R*-phenyethylethyl)-3-cyclohexylpropionamide (Compound 103);

N-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-2-cyclohexylethyl]succinamic acid (Compound

104); ^{1}H NMR ($CDCl_3$): 7.87 (m, 1H), 7.62 (m, 1H), 7.52 (m, 1H), 7.43 (m, 1H), 7.15 (m, 6H), 6.89 (m, 1H), 5.62 (m, 1H), 4.56 (m, 1H), 2.75 (m, 2H), 2.70 (m, 1H), 2.48 (m, 2H), 2.16 (m, 1H), 1.6 (m, 7H), 0.7-1.4 (m, 7H); MS: m/e 534;

N-[1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-cyclohexylethyl]succinamic acid (Compound 105); ^{1}H NMR ($CDCl_3$): 12.04 (s, 1H), 7.89 (m, 1H), 7.80 (m, 1H), 7.65 (m, 2H), 7.36 (m, 2H), 7.13-7.29 (m, 4H), 6.08-6.23 (m, 1H), 4.62-4.93 (m, 1H), 4.15 (m, 1H), 2.64 (m, 1H), 2.50 (m, 1H), 2.34 (m, 6H), 1.78 (m, 1H), 1.45-1.68 (m, 4H), 1.37 (m, 1H), 0.95-1.3 (m, 3H), 0.87 (m, 2H); MS: m/e=535.8;

N-{1*S*-[1*S*-benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-2-cyclohexylethyl}oxalamic acid (Compound 106); ^{1}H NMR ($CDCl_3$): 6.6-7.9 (m, 10H), 5.6 (m, 1H), 4.5 (m, 1H), 2.72 (m, 1H), 2.45 (m, 1H), 0.8-2.1 (m, 15H); MS: m/e 506.2;

N-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-cyclohexethyl]-3*H*-imidazole-4-carboxamide (Compound 107); ^{1}H NMR ($CDCl_3$): 8.1 (m,1H), 7.3-7.6 (m, 3H), 6.95-7.2 (m, 8H), 5.62 (m, 1H), 4.74 (m, 1H), 2.77 (m, 2H), 2.38 (m, 1H), 2.25 (m, 1H), 0.8-1.9 (m, 13H); MS: m/e 528.2;

N-[1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenylethylethylcarbamoyl]-2)-cyclohexylethyl]-3*H*-imidazole-4-carboxamide (Compound 108); ^{1}H NMR ($CDCl_3$): 7.0-7.6 (m, 12H), 5.05 (m, 1H), 4.5 (m, 1H), 2.75 (m, 2H), 0.6-2.2 (m, 15H); MS: m/e 529.6;

tert-butyl 1*R*-(1-benzooxazol-2-ylcarbonylcyclobutylcarbamoyl)-2-benzylsulfonylethylcarbamate (Compound 109), m.p. = 70-85°C, MH^+ 542;

N-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-cyclohexylethyl]malonamic acid (Compound 110); ^{1}H NMR ($CDCl_3$): 6.8-7.9 (m, 9H), 5.63 (m, 1H), 4.56 (m, 1H), 2.6-2.8 (m, 4H), 2.0-2.4 (m, 2H), 0.7-2.0 (m, 13H); MS: m/e 520.4;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-*o*-tolylmethylsulfonylethyl]morpholine-4-carboxamide (Compound 111); ^{1}H NMR 300mHz (DMSO-d_6) PPM, 8.841 (d, J=6.2Hz, 1H), 7.942 (d, J=5.2Hz, 1H), 7.860 (d, J=8.4Hz, 1H), 7.618 (t, J=8.1Hz, 1H), 7.516 (t, J=8.1Hz. 1H), 7.16 (m, 10H), 5.22 (m, 1H), 4.78 (m, 1H), 4.516 (s, 2H), 3.567 (m, 2H), 3.500 (m, 6H), 3.3 (s, 3H), 2.75 (m, 1H), 2.65 (m, 1H), 2.44 (m, 1H), 2.26 (m, 2H), 2.01 (m, 1H); MS: M^+=633.4 M^-=631.4;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-nitrobenzylsulfonyl)ethyl]morpholine-4-carboxamide (Compound 112); ^{1}H NMR 300mHz (DMSO-d_6) PPM, 8.840 (d, J=7.0Hz, 1H), 8.025 (d, J=8.0Hz, 1H), 7.950 (d, J=8.4Hz, 1H), 7.858 (d, J=7.7Hz, 1H), 7.730 (d, J-8.8Hz, 1H), 7.646 (t, J=8.4Hz, 1H), 7.515 (t, J=7.7Hz, 1H), 5.223 (m, 1H), 5.004 (s, 2H), 4.694 (m, 1H), 3.561 (m, 2H), 3.510 (m, 6H), 2.756 (m, 1H), 2.652 (m, 1H), 2.429 (m, 2H), 2.243 (m, 1H), 1.983 (m, 1H); MS: M^+=664.2 M^-=662.4;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-chlorobenzylsulfonyl)ethyl]morpholine-4-carboxamide (Compound 113); ^{1}H NMR 300mHz (DMSO-d_6) PPM, 8.851 (d, J=6.2Hz, 1H), 7.953 (d, J=8.8Hz, 1H), 7.855 (d, J=8.4Hz, 1H), 7.627 (t, J=6.6Hz, 1H), 7.498 (m, 3H), 7.365 (m, 2H), 7.211 (m, 6H), 5.220 (m, 1H), 4.774 (m, 1H), 4.659(m, 2H), 3.578 (m, 2H), 3.499 (m, 6H), 2.752 (m, 1H), 2.648 (m, 1H), 2.472 (m, 2H), 2.243 (m, 1H), 1.992 (m, 1H); MS: M^+=653.2;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide (Compound 114); NMR 300mHz (DMSO-d_6), 8.64 (d, J=7.4H_3, 1H), 8.01 (d, J=8.8H_3, 1H), 7.91 (d, J=9.1H_3, 1H), 7.68 (t, J=6H_3, 1H), 7.55 (t, J=8.2H_3, 1H), 7.38 (s, 5H), 7.05 (d, J=9.6H, 1H), 5.26 (m, 1H), 4.72 (m, 1H), 4.49 (s, 2H), 3.55 (m, 4H), 3.5-3.2(m, 6H), 1.96 (m, 1H), 1.76 (m, 1H), 1.38 (m, 4H), 0.87 (t, J=7.4H_3, 3H); MS: 571.24 M^+=570.20;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-*o*-tolylmethylsulfonylethyl]morpholine-4-carboxamide (Compound 115); NMR 300mHz (DMSO-d_6), 8.70 (d, J=6.9H_3, 1H), 8.01(d, J=9.1H_3, 1H), 7.91 (d, J=8.8H_3, 1H), 7.67 (t, J=8H_3, 1H), 7.55 (t, J=8.5H, 3H), 7.3-7.1 (m, 4H), 7.05 (d, J=9.6H_3 H), 5.26 (m, 1H), 4.80 (m, 1H), 4.53 (s, 2H), 3.58 (m, 4H), 3.33 (m, 6H), 2.33 (s, 3H), 1.96 (m, 1H), 1.72 (m, 1H), 1.35 (m, 4H), 0.87 (t, J=7.7H_3); MS=585.30, M^+=584.23;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-nitrobenzylsulfonyl)ethyl]morpholine-4-carboxamide (Compound 116); NMR 300mHz (DMSO-d_6), 8.70 (d, J=7.2H_3, 1H), 8.1-7.5 (m, 8H), 7.05 (d, J=9.3H_3, 1H), 5.26 (m, 1H), 5.01 (s, 2H), 4.70 (m, 1H), 3.57 (m, 5H), 3.30 (m, 5H), 1.96 (m, 1H), 1.72 (m, 1H), 1.34 (m, 4H), 0.87 (t, J=7.7H_3, 3H); MS: 616.09 M^+=615.20;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-chlorobenzylsulfonyl)ethyl]morpholine-4-carboxamide (Compound 117); NMR 300mHz (DMSO-d_6), 8.71 (d, J=7.1H_3, 1H), 8.1-73 (m, 8H), 7.06 (d,J=9.6H_3, 1H), 5.26 (m, 1H), 4.79 (m, 1H), 4.72 (d, J=15H_3, 1H), 4.65 (d, J=15H_3, 1H), 3.56 (m, 4H), 3.30 (m, 6H), 1.96 (m, 1H), 1.73 (m, 1H), 1.35 (m, 4H), 0.87 (t, J=7.7H_3, 3H); MS: 605.24 M+=605.10;

N-[1*R*-(2-benzooxazol-2-yl-1,1-dimethyl-2-oxoethylcarbamoyl)-2-*o*-tolylmethylsulfonylethyl]morpholine-4-carboxamide (Compound 118); MS: (M^++1) 557;

N-[1*R*-(2-benzooxazol-2-yl-1,1-dimethyl-2-oxoethylcarbamoyl)-2-(2-chlorobenzylsulfonyl)ethyl]morpholine-4-carboxamide (Compound 119); MS: (M^++1) 578;

N-[1*R*-(2-benzooxazol-2-yl-1,1-dimethyl-2-oxoethylcarbamoyl)-2-(2-nitrobenzylsulfonyl)ethyl]morpholine-4-carboxamide (Compound 120);^{1}H NMR: (DMSO) 9.34 (s, 1H), 8.02 (d, J=7.7Hz, 1H), 7.82-7.45 (m, 7H), 6.74 (d, J=8.8Hz, 1H), 4.87 (m, 2H), 4.64 (m, 1H), 3.44-3.11 (m, 10H), 1.56 (s, 3H), 1.50 (s, 3H); MS: (M^++1) 588;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl) 2-pyrid-2-ylmethylsulfonylethyl]piperidine-4-carboxamide (Compound 121); MS:m/e +1=616.2;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-pyrid-2-ylmethylsulfonylethyl]morpholine-4-carboxamide (Compound 122); ^{1}H NMR : 8.62 (d, 6.9 Hz, 1 H), 8.55 (d, 3.2 Hz, 1H), 8.00 (d, 7.0 Hz, 1H), 7.86 (m, 2H), 7.65 (t. 6.2 Hz, 1H), 7.48-7.58 (m, 2H), 7.40 (m, 1H), 7.06-7.25 (m, 3H), 5.28 (m, 1H), 4.74 (m, 1H), 4.67 (d, 1.1 Hz, 2H), 3.53 (m, 4H), 3.31 (m, 4H), 1.99 (m, 1H), 1.75 (m,1H), 1.32 (m, 4H), 0.87 (t, 6.7 Hz, 3H);
MS: M+1 = 571.8;
N-[1*R*-(1*R*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide (Compound 123);
N-[1*R*-(1-benzooxazol-2-ylcarbonylcyclobutylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide (Compound 124), MH^+ 555;
benzyl 1*S*-(2-benzooxazol-2-yl-2-hydroxyethylcarbamoyl)-3-methylbutylcarbamate (Compound 125);
2*S*-acetylamino-*N*-(2-benzooxazol-2-yl-1*S*-methyl-2-oxoethyl)-3-cyclohexylpropionamide (Compound 126); ^{1}H NMR ($CDCl_3$): 7.92 (d, J=8.4Hz, 1H), 7.73-7.67 (m, 1H), 7.60-7.48 (m, 2H), 5.94 (d, J=8.7Hz, 1H), 6.65 (m, 1H), 2.03 (d, J=7.2Hz, 2H), 1.64 (m, 6H), 1.56-0.92 (m, 10Hz); MS ESI: MH^+ 386;
tert-butyl 1*R*-(1-benzooxazol-2-ylcarbonylcyclobutylcarbamoyl)-2-benzylsulfanylethylcarbamate (Compound 127);
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-methylsulfonylpropylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide (Compound 128); ^{1}H NMR ($CDCl_3$): 7.89 (d, J=7.4Hz, 1H), 7.65 (m, 1H), 7.57 (m, 1H), 7.48 (m, 1H), 7.4 (m, 5H), 6.0 (m, 1H), 5.7 (m, 1H), 4.93 (m, 1H), 4.33 (m, 3H), 3.70 (m, 5H), 3.25-3.4 (m, 7H), 2.93 (m, 3H), 2.8 (m, 1H), 2.35 (m, 1H); MS: m/e 653.2;
N-[1-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-3-phenylsulfanylpropyl]morpholine-4-carboxamide (Compound 129); ^{1}H NMR (DMSO): 8.52 (d,J = 8Hz, 1H), 8.98 (d,J = 8Hz, 1H), 8.88 (d,J = 9Hz, 1H), 7.64 (t,J = 8Hz, 1H), 7.53 (t,J = 9Hz, 1H), 7.30 (m, 4H), 7.19 (m, 1H), 5.25 (m, 1H), 4.35 (m, 1H); 3.51 (m, 4H), 3.26 (m, 4H), 2.94 (t, J=8Hz, 2H), 1.9 (m, 3H), 1.7 (m, 1H), 1.31 (m, 4H), 0.86 (t,J=8Hz, 3H), 6.53 (d,J=9Hz, 1H); MS: m/e=539.24;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl) 2-(2-trifluoromethylbenzylsulfonyl)ethyl]morpholine-4-carboxamide (Compound 131); ^{1}H NMR: (DMSO) 8.78 (d, J=8Hz, 1H), 8.06-7.50 (m, 8H), 7.04 (d, J=8Hz, 1H), 5.27 (m, 1H), 4.82-4.64 (m, 3H), 3.65-3.25 (m, 10H), 1.96 (m, 1H), 1.71 (m, 1H), 1.41-1.22 (m, 4H),), 0.84 (t, J=7Hz, 3H). MS: (M^++1) 639;
N-[1*R*-(1*S*-benzooxazol-2 ylcarbonyl-3-phenylpropylcarbamoyl)-2-pyrid-2-ylmethylsulfonylethyl]morpholine-4-carboxamide (Compound 132);^{1}H NMR (DMSO): 8.78 (d,J=7.2Hz, 1H), 8.56 (d,J=5.4Hz, 1H), 7.98 (d,J=8.4Hz, 1H), 7.85 (m, 2H), 7.64 (t,J=12.1Hz, 1H), 7.52 (m, 2H), 7.38 (m, 1H), 7.10-7.34 (m, 8H), 5.25 (m, 1H), 4.70 (m, 3H), 3.55-3.70 (m, 4H), 3.35 (s, 4H), 2.80 (m, 2H), 2.25 (m, 1H), 2.0 (m, 1H); MS: m/e (+1) = 620.0;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-methylsulfonylpropylcarbamoyl)-2-pyrid-2-ylmethylsulfonylethyl]morpholine-4-carboxamide (Compound 133); ^{1}H NMR (DMSO): 8.83 (d,J=7.6Hz, 1H), 8.55 (d,J=4.0Hz, 1H), 7.97 (d, J=7.6Hz, 1H), 7.88 (m, 3H), 7.64 (t,J=7.2Hz, 1H), 7.39-7.54 (m, 4H), 7.15 (d, J=7.6Hz, 1H), 5.36 (m, 1H), 4.70 (m, 3H), 3.56 (m, 6H), 3.24 (m, 4H), 2.40 (m, 1H), 2.15 (m, 1H), 2.99 (s, 3H); MS: m/e (+1) = 622.2;
2-[2-(1-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-morpholin-4-ylcarbonylamino)ethanesulfonylmethyl]pyridine 1-oxide (Compound 134); ^{1}H NMR (DMSO): 8.75 (d, J=6.5Hz, 1H), 8.38 (m, 2H), 7.96 (d, J=7.7Hz, 1H), 7.89 (d,J=7.7Hz, 1H), 7.48-7.69 (m, 6H), 7.05 (d, J=6.8Hz, 1H), 5.22 (m, 1H), 4.95 (d, J=2.7Hz, 2H), 5.85 (m, 1H), 5.53 (m, 4H), 3.30 (s, 4H), 1.95 (m, 1H), 1.70 (m, 1H), 1.30 (m, 4H), 0.88 (t, J=5.4Hz, 3H);
MS: MW = 587.65 M+1 = 588.2;
N-1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethyl]morpholine-4-carboxamide (Compound 135); NMR 300mHz (DMSO-d_6), 8.70 (d, J=7.1H_3, 1H), 8.01 (d, J=8.8H_3, 1H), 7.91 (d, J=9.1H_3, 1H), 7.65 (t, J=8H_3, 1H), 7.55 (t, J=8.2H), 7.11 (t, J=8.2H), 7.4-6.8 (m, 5H), 5.28 (m, 1H), 4.76 (m, 1H), 4.5 (s, 2H), 3.55 (m, 4H), 3.3 (m, 6H), 1.93 (m, 1H), 1.71 (m, 1H), 1.42 (m, 2H), 0.91 (t, J=8H_3, 3H); MS: 623.38 M+=622.19;
N-[3-phenylsulfonyl-1-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamol)propyl]morpholine-4-carboxamide (Compound 136); ^{1}H NMR (DMSO): 8.5 (m, 2H), 8.00 (d,J = 9Hz, 1H), 7.9-7.5 (m, 8H), 6.54 (t,J = 9Hz, 1H), 4.28 (m, 1H), 3.49 (m, 4H), 3.24 (m, 6H), 1.90 (m, 3H), 1.65 (m, 1H), 1.31 (m, 4H), 0.85 (t,J=7Hz, 3H); MS: m/e=571.39;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl) 2-(2-difluoromethoxybenzylsulfonyl)ethyl]morpholine-4-carboxyamide (Compound 137); ^{1}H NMR: (DMSO) 8.66 (d, J=6.6Hz, 1H), 7.99 (d, J=8Hz, 1H), 7.87 (d, J=8Hz, 1H), 7.67-6.83 (m, 8H), 5.25 (m, 1H), 4.73 (m, 1H), 4.54 (s, 2H), 3.60-3.23 (m, 10H), 1.93 (m, 1H), 1.68 (m, 1H), 1.40-1.22 (m, 4H), 0.84 (t, J=6.7Hz, 3H); MS: (M^++1) 637;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethyl]isonicotinamide

(Compound 138); ^{1}H NMR: (DMSO) 9.22 (d, J=8Hz, 1H), 8.87 (d, J=6Hz, 1H), 8.70 (m, 2H), 7.97-7.19 (m, 10H), 7.08 (t, $J_{H,F}$=74Hz, 1H), 5.30-5.09 (m, 2H), 4.58 (s, 2H), 3.73-3.59 (m, 2H), 1.94 (m, 1H), 1.71 (m, 1H), 1.41-1.22 (m, 4H),), 0.82 (t, J=6.7Hz, 3H); MS: (M^++1) 629;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-pyrid-2-ylmethylsulfonyl)ethyl]morpholine-4-carboxamide (Compound 139);^{1}H NMR (DMSO): 8.6 (m, 2H), 8.05 (d,J=5.1Hz, 1H), 7.85 (m, 2H), 7.3-7.8 (m, 4H), 7.2 (m, 3H), 5.32 (m, 1H), 4.72 (m, 1H), 4.65 (d,J=3.1Hz, 2H), 3.21-3.75 (m, 8H), 1.90 (m, 1H), 1.75 (m, 1H), 1.45 (m, 2H), 0.90 (t,J=4.5Hz, 3H); MS:m/e +1=558.2;MS: m/e (+1) = 558.2;

2-[2*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-morpholin-4-ylcarbonylaminoethylsulfonylmethyl]pyridine 1-oxide (Compound 140); ^{1}H NMR (DMSO): 8.57 (m, 3H), 7.97 (m, 1H), 7.63-7.82 (m, 3H), 7.35-7.45 (m, 4H), 6.93 (m, 1H), 4.50-4.95 (m, 2H), 4.18 (m, 2H), 3.10-3.80 (m, 8H), 1.10-1.70 (m, 4H), 0.82 (t,J=5.4Hz, 3H); MS:m/e (+1) =574.2;

1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethylcarbamate (Compound 141); MS: (M^++1) 582;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-benzylsulfonylethyl]succinamic acid (Compound 142); ^{1}H NMR: (DMSO) 12.09 (s, 1H), 8.63 (d, J=6Hz, 1H), 8.51 (d, J=8Hz, 1H), 7.98 (d, J=8Hz, 1H), 7.87 (d, J=8Hz, 1H), 7.62 (t, J=8Hz, 1H), 7.52 (t, J=8Hz, 1H), 7.38-7.30 (m, 5H), 5.25 (m, 1H), 4.84 (m, 1H); 4.46 (s, 2H), 3.53-3.21 (m, 2H), 5.28-5.25 (m, 4H), 1.93 (m, 1H), 1.68 (m, 1H), 1.40-1.22 (m, 4H), 0.84 (t, J=6.2Hz, 3H); MS: (M^++1) 558;

2*R*-[3,3-bis(2-methoxyethyl)ureido]-*N*-(1*S*-benzooxazol-2-ylcarbonylpentyl)-3-benzylsulfonylpropionamide (Compound 143); ^{1}H NMR: (DMSO) 8.50 (d, J=6.6Hz, 1H), 7.98 (d, J=8Hz, 1H), 7.88 (d, J=8Hz, 1H), 7.62 (t, J=8Hz, 1H), 7.52 (t, J=8Hz, 1H), 7.38-7.30 (m, 5H), 6.82 (d, J=8Hz, 1H), 5.26 (m, 1H), 4.70 (m, 1H), 4.46 (s, 2H), 3.52-3.22 (m, 10H), 3.31 (s, 6H), 1.94 (m, 1H), 1.69 (m, 1H), 1.40-1.22 (m, 4H), 0.85 (t, J=6.6Hz, 3H); MS: (M^++1) 617;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl) 2-(6-methylpyrid-2-ylmethylsulfonyl)ethyl]isonicotinamide (Compound 144); ^{1}H NMR (DMSO): 8069 (t,J =6Hz, 1H), 8.55 (d,J =9Hz, 1H), 7.91 (m, 2H), 7.51 (m, 3H), 4.51 (m, 1H), 4.11 (d,J =6Hz, 2H), 1.5 (m, 15H); MS: m/e=328.05;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]succinamic acid (Compound 145); MS (ESI) MH+ 478.2;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-trifluoromethylbenzylsulfonyl)ethyl]tetrahydropyran-4-carboxamide (Compound 146);

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-thien-3-ylmethylsulfonylethyl]isonicotinamide (Compound 147);

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenypropylcarbamoyl)-2-(6-methylpyrid-2-ylmethylsulfonyl)ethyl]tetrahydropyran-4-carboxamide (Compound 148);

N-[1*R*-(1-benzooxazol-2-ylcarbonylcyclobutylcarbamoyl)-2-(2-trifluoromethylbenzylsulfonyl)ethyl]tetrahydropyran-4-carboxamide (Compound 149);

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-pyrid-3-ylmethylsulfonylethyl]pyrazine-2-carboxamide (Compound 150);

N-[1-(1-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-thien-3-ylmethylsulfonylethyl]piperidine-4-carboxamide (Compound 151);

N-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-thien-3-ylmethylsulfonylethyl]azetidine-3-carboxamide (Compound 152);

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl)butylcarbamoyl)-2-pyrid-3-ylmethylsulfonylethyl]moropoline-4-carboxamide (Compound 153); ^{1}H NMR (DMSO): 8.66 (d, J=6.7Hz, 1H), 8.56 (m, 3H), 8.01 (d, J=7.9Hz, 1H), 7.90 (d, J=8.1Hz, 1H), 7.79 (m, 1H), 7.65 (t, J=7.1Hz, 1H), 7.55 (t, J=7.1Hz, 1H), 7.43 (dd, J=4.9,7.9Hz, 2H), 6.93 (d, J=8.40Hz, 1H), 5.30 (m, J=1Hz, 1H), 4.76 (m, 1H), 4.57 (d, J=3.7Hz, 2H), 3.24-3.70 (m, 8H), 1.91 (m, 1H), 1.73 (m, 1H), 1.40 (m, 2H), 0.82 (t, J=5.4Hz, 3H); MS:m/e (+1) = 555.8;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]piperazine-1-carboxamide (Compound 154);

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-methylsulfonylpropylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl) ethyl]morpholine-4-carboxamide (Compound 155); ^{1}H NMR ($CDCL_3$, 300MHz) 7.8944 (d, J=7.92Hz, 1H), 7.67 (m, 1H), 7.58 (m, 1H), 4.49 (m, 2H), 7.415 (m, 1H), 7.24 (m, 3H), 6.5811 (t, J=73.24Hz, 1H), 5.7633 (m, 1H), 4.9199 (m, 1H), 4.4871 (dd, J=13.61, 23.75Hz, 2H), 3.7101 (m, 4H), 3.4189 (m, 4H), 3.27 (m, 2H), 2.9289 (s, 3H), 2.77 (m, 1H), 2.37 (m, 1H); MS: (M^+) 687.3 (M^-) 685.6;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-methylesulfonylpropylcarbamoyl)-2-(2-methoxybenzylsulfonyl)ethyl]morpholine-4-carboxamide (Compound 156); ^{1}H NMR ($CDCl_3$): 7.89 (m, 1H), 7.45-7.8 (m, 3H), 7.35 (m, 2H), 6.9-7.05 (m, 2H), 5.83-5.9 (m, 1H), 5.62-5.8 (m, 1H), 4.82 (m, 1H), 4.40 (m, 2H), 3.89 (s, 3H), 3.70 (m, 5H), 3.25-3.42 (m, 7H), 2.95 (s, 3H), 2.75 (m, 1H), 2.35 (m, 1H); MS: m/e 651.4;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-benzylsulfonylethyl]piperazine-1-carboxamide (Com-

pound 157); ^{1}H NMR: (DMSO) 9.20-9.11 (m, 2H), 8.73 (m, 1H), 7.98 (d, J=8Hz, 1H), 7.88 (d, J=8Hz, 1H), 7.63 (t, J=8Hz, 1H), 7.52 (t, J=8Hz, 1H), 7.39-7.30 (m, 5H), 5.24 (m, 1H), 4.74 (m, 1H), 4.50 (s, 2H), 3.62-3.30 (m, 6H), 3.05-2.95 (m, 4H), 1.94 (m, 1H), 1.69 (m, 1H), 1.40-1.22 (m, 4H), 0.84 (t, J=6.6Hz, 3H); MS: (M^++1) 570;

N-(1*S*-benzooxazole-2-ylcarbonyl-3-methylsulfonylpropyl]-2*R*-methylsulfonylamino-3-benzylsulfonylpropionamide (Compound 160); ^{1}H NMR (DMSO-d6) 7.9498 (m, 2H), 7.6577 (m, 1H), 7.5556 (m, 1H), 7.3870 (m, 5H), 5.4016 (m, 1H), 4.5444 (m, 3H), 3.32 (m, 2H), 2.9784 (s, 1H), 2.9326 (s, 1H), 2.49 (m, 1H), 2.20 (m, 1H); MS: (M^+) 586.0, (M^-) 584.0;

methyl 1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-pyrid-2-ylmethylsulfonylethylcarbamate (Compound 161); MS: m/e (+1) = 564.6;

methyl 1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-methylsulfonylpropylcarbamoyl)-2-benzylsulfonylethylcarbamate (Compound 162); ^{1}H NMR (DMSO): 9.03 (d, J=7.2Hz, 1H), 7.97 (d, J=7.9Hz, 1H), 7.90 (d, J=8.2Hz, 1H), 7.65 (td, J=7.2, 1.2Hz, 1H), 7.55 (t, J=7.9Hz, 1H), 7.37 (m, 5H), 5.32 (m, 1H), 4.65 (m, 1H), 4.50 (m, 2H), 3.53 (m, 1H), 3.49 (s, 3H), 3.33 (s, 2H), 3.24 (m, 1H), 2.98 (s, 3H), 2.41 (m, 1H), 2.18 (m, 1H); MS: m/e 653.2;

N-(1*S*-benzooxazol-2-ylcarbonylpentyl)-2*R*-[3,3-di(2-methoxyethyl)ureidol-3-pyrid-2-ylmethylsulfonylpropionamide (Compound 163); MS:m/e +1=615.6;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-(2-methoxybenzylsulfonyl]ethyl]morpholine-4-carboxamide (Compound 164); ^{1}H NMR (DMSO): 8.66 (d,J =6Hz, 1H), 8.03 (d,J = 9Hz, 1H), 7.93 (d,J = 9Hz, 1H), 7.68 (t, J = 8Hz, 1H), 7.58 (t,J =9Hz, 1H), 7.36 (m, 2H), 7.0 (m, 3H), 5.29 (m, 1H), 4.77 (m, 1H), 4.54 (d,J = 14Hz, 1H), 4.43 (d,J =14Hz, 1H), 3.84 (s, 3H), 3.5-3.3 (m, 10H), 1.95 (m, 1H), 1.74 (m, 1H), 1.46 (m, 2H), 0.93 (t, J=8Hz, 3H); MS: m/e=587.31;

N-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2*R*-(3,3-dimethylureido) 3-(2-methoxybenzylsulfonyl)propionamide (Compound 165); NMR 300mHz (DMSO-d_6), 8.63 (d, J=6.9H_3, 1H), 8.03 (d, J=8.8H_3, 1H), 7.92 (d, J=9.1,1H), 7.70 (t, J=8.8H_3, 1H), 7.58 (t, J=8.2H_3, 1H), 7.37 (m, 2H), 7.08 (d, J=9.1H_3, 1H), 6.98 (t, J=8.2H_3, 1H), 6.71 (d, J=9.1H_3, 1H), 5.27 (m, 1H), 4.77 (m, 1H), 4.55 (d, J=15.1H_3, 1H), 4.43 (d, J=15.1H_3, 1H), 3.79 (s, 3H), 3.47 (d, J=6.9H_3, 2H), 2.83 (s, 6H), 1.93 (m, 1H), 1.75 (m, 1H), 1.43 (m, 2H), 0.93 (t, J=8H_3, 3H);

N-(1*S*-benzooxazol-2-ylcarbonylbutyl)-2-methylsulfonylamino-3-(2-methoxybenzylsulfonyl)propionamide (Compound 166); ^{1}H NMR (DMSO): 9.0 (d,J = 6Hz, 1H), 8.01 (d,J = 8Hz, 1H), 7.91 (d,J = 8Hz, 1H), 7.67 (t,J = 7Hz, 1H), 7.57 (t,J = 8Hz, 1H), 7.36 (t, J=8Hz, 2H), 7.07 (d, J=8Hz, 1H), 6.97 (dt, J=2,7Hz, 1H), 7.85 (m, 1H); 5.33 (m, 4H), 4.5 (m, 3H), 3.8 (s, 3H), 3.35 (m, 2H), 2.92 (s, 3H), 1.93 (m, 1H), 1.72 (m, 1H), 1.44 (m, 2H), 0.91 (t, J=7Hz, 3H); MS: m/e=552.19;

3-cyclohexyl-*N*-[2-hydroxy-2-(5-nitrobenzooxazol-2-yl)-1*S*-phenethylethyl]propionamide (Compound 167); MS (ESI) m/z = 466 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.95 (m, 2H), δ 1.22 (m, 4H), δ 1.51 (m, 2H), δ 1.65 (m, 6H), δ 2.15 (m, 2H), δ 2.65 (m, 2H), δ 4.15 (m, 1H), δ 4.50 (m, 1H), δ 5.08 (m, 1H), δ 5.80 (d, J = 6 Hz, 1H), δ 6.09 (m, 1H), δ 7.00 - 7.35 (m, 5H), δ 7.60 (m, 1H), δ 8.40 (m, 1H), δ 8.55 (m, 1H), ($C_{26}H_{31}N_3O_5$);

methyl 2-[2*S*-(3-cyclohexylpropionylamino)-1-hydroxy-4-phenylbutyl]benzooxazole-6-carboxylate (Compound 168); MS (ESI) m/z = 478 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.84 (m, 2H), δ 1.22 (m, 4H), δ 1.51 (m, 7H), δ 1.90 (m, 1H), δ 2.11 (m, 2H), δ 2.65 (m, 2H), δ 3.95 (s, 3H), δ 4.19 (m, 1H), δ 4.50 (m, 1H), δ 5.09 (s, 1H), δ 6.09 (m, 1H), δ 6.49 (m, 1H), 8 7.01 - 7.35 (m, 5H), δ 7.65 (m, 1H), δ 8.01 (m, 1H), δ 8.17 (m, 1H), ($C_{28}H_{34}N_2O_5$);

N-[2-(5-chlorobenzooxazol-2-yl)-2-hydroxy-1*S*-phenethylethyl]-3-cyclohexylpropionamide (Compound 169); MS (ESI) m/z = 455 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.84 (m, 2H), δ 1.12 (m, 4H), δ 1.20 (m, 2H), δ 1.51 (m, 6H), δ 2.00 (m, 3H), δ 2.65 (m, 2H), δ 4.21 (m, 1H), δ 4.50 (m, 1H), δ 5.02 (s, 1H), δ 6.44 (m, 1H), δ 7.01 - 7.47 (m, 7H), δ 7.65 (s, 1H), ($C_{26}H_{31}ClN_2O_3$);

benzyl 1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylsulfamoylmethyl)-3-methylbutylcarbamate (Compound 170); ^{1}H NMR ($CDCl_3$): 7.71 (m, 1H), 7.52 m, 1H), 7.20-7.40 (m, 12H), 5.9 (m, 0.5H), 5.6 (m, 0.5H), 4.80-5.20 (m, 5H), 4.1-4.3 (m, 2H), 2.7-2.9 (m, 4H), 1.7-2.0 (m, 2H), 0.90 (m, 3H), 0.79 (m, 3H), 3.30 (m, 1H);

N-[1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylsulfamoylmethyl) 3-methylbutyl]acetamide (Compound 171);

benzyl 1*S*(2-benzooxazol-2-yl-2-hydroxy-1*S*phenethylethylsulfamoylmethyl)-3-methylbutylcarbamate (Compound 172); ^{1}H NMR (DMSO): 7.71 (m, 1H), 7.5 (m, 1H), 7.0-7.4 (m, 12H), 4.9-6.2 (m, 6H), 4.0-4.35 (m, 2H), 3.75 (m, 1H), 3.20-3.60 (m, 2H), 2.5-3.0 (m, 2H), 1.15-2.15 (m, 3H), 0.6-1.05 (m, 6H); MS: m/e 580.1;

N-[1*R*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylsulfamoylmethyl)-3-methylbutyl]acetamide (Compound 173);

2*S*-acetylamino-*N*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-cyclohexylpropionamide (Compound 174);

tert-butyl 1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl]-2-cyclohexylethyl)carbamate (Compound 175);

2-acetylamino-*N*-2-benzooxazol-2-yl-1,1-dimethyl-2-oxoethyl)-3-cyclohexylpropionamide (Compound 176);

benzyl 1*S*-[2-(5-phenylbenzooxazol-2-yl)-2-hydroxyethylcarbamoyl]-3-methylbutylcarbamate (Compound 177);

N-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-cyclopentylpropionamide (Compound 178); ^{1}H NMR

($CDCl_3$): 7.72 (m, 1H), 7.53 (m, 1H), 7.08-7.19 (m, 8H), 5.98 (m, 1H), 5.05 (m, 2H), 4.51 (m, 1H), 2.6-2.8 (m, 4H), 2.17-2.29 (m, 1H), 1.95-2.15 (m, 2H), 1.8-1.95 (m, 1H), 1.68-1.78 (m, 1H), 1.3-1.7 (m, 6H), 1.0-1.12 (m, 1H), 0.85-1.0 (m, 1H);

N-(2-benzooxazol-2-yl-2-hydroy-1*S*-phenyethylethyl)-2-bicyclo[2.2.1]hept-2-ylacetamide (Compound 179);

N-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-2-naphthalen-1-ylacetamide (Compound 180);

N-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-phenylpropionamide (Compound 181); ^1H NMR ($CDCl_3$): 7.69 (m, 1H), 7.53 (m, 1H), 7.37 (m, 2H), 7.03-7.35 (m, 10H), 5.9 (m, 1H), 4.98 (m, 1H), 4.40-4.55 (m, 1H), 3.0 (m, 1H), 2.80 (t, J=7.7Hz, 2H), 2.55 (m, 2H), 2.38 (t, J=7.5Hz, 2H);

methyl 2-[2*S*-(3-cyclohexylpropionylamino)-1-hydroxy-4-phenylbutyl]-4,5-dihydrooxazole-4*S*-carboxylate (Compound 182); MS (ESI) m/z = 431 (M + 1); ^1H-NMR (300 MHz, $CDCl_3$): δ 0.89 (m, 2H), δ 1.20 (m, 4H), δ 1.48 (m, 2H), δ 1.65 (m, 6H), δ 2.00 (m, 2H), δ 2.15 (m, 2H), δ 2.73 (t, J = 4 Hz, 2H), δ 3.76 (s, 3H), δ 4.30 - 4.65 (m, 5H), δ 6.00 (d, J = 6Hz, 1H), δ 7.13 - 7.35 (m, 5H), ($C_{24}H_{34}N_2O_3$);

methyl 2-[2*S*-(3-cyclohexylpopionylamino)-1-hydroxy-4-phenylbutyl]oxazole-4-carboxylate (Compound 183);

N-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethyl)-4-cyclohexylbutyramide (Compound 184); ^1H NMR ($CDCl_3$): 7.62-7:73 (m, 1H), 7.46-7.59 (m, 1H), 7.05-7.43 (m, 2H), 6.22-6.38 (m, 1H), 5.11 (s, 1H), 4.50-4.69 (m, 1H), 2.58-2.82 (m, 2H), 2.14-2.24 (m, 1H), 2.0, 2.14 (m, 1H), 1.50-1.76 (m, 6H), 1.31-1.50 (m, 1H), 0.94-1.31 (m, 7H), 0.63-0.93 (m, 2H); MS: m/e=435.1;

methyl 2-[2*S*-(3-cyclohexylpropionylamino)-1-hydroxyphenylbutyl]-4,5-dihydrooxazole-4*R*-carboxylate (Compound 185); MS (ESI) m/z = 431 (M + 1); ^1H-NMR (300 MHz, $CDCl_3$): δ 0.89 (m, 2H), δ 1.20 (m, 4H), δ 1.48 (m, 2H), δ 1.65 (m, 6H), δ 2.00 (m, 2H), δ 2.15 (m, 2H), δ 2.73 (t, J = 4 Hz, 2H), δ 3.76 (s, 3H), δ 4.35 - 4.72 (m, 5H), δ 5.75 (m, 1H), δ 7.13 - 7.35 (m, 5H), ($C_{24}H_{34}N_2O_5$);

3-cyclohexyl-*N*-[2-hydroxy-2-(5-trifluoromethylbenzooxazol-2-yl)-1*S*-phenethylethyl]propionamide (Compound 186); MS (ESI) m/z = 489 (M + 1); ^1H-NMR (300 MHz, $CDCl_3$): δ 0.77 (m, 2H), δ 1.22 (m, 4H), δ 1.51 (m, 2H), δ 1.60 (m, 6H), δ 2.15 (m, 4H), δ 2.70 (m, 2H), δ 4.51 (m, 1H), δ 5.11 (s, 1H), δ 6.10 (d, J = 6 Hz, 1H), δ 7.00 - 7.35 (m, 5H), δ 7.56 (s, 2H), δ 7.99 (s, 1H), ($C_{27}H_{31}F_3N_2O_3$);

2*S*-acetylamino-*N*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethyl)-3-(2-trifluoromethylphenyl)propionamide (Compound 187);

methyl 1-(1-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-cyclohexylethylcarbamate (Compound 188); ^1H NMR ($CDCl_3$): 7.89 (d,J=7.4Hz, 1H), 7.62 (M, 1H0, 7.54 (m, 1H), 7.46 (m, 1H), 7.13-7.30 (m, 1H), 6.87 (d, J=7.9Hz, 1H), 5.68 (m, 1H), 5.04 (d, J=9.6Hz, 1H), 4.24 (m, 1H), 3.66 (s, 3H), 2.75 (5,J=8.3Hz, 2H), 2.45 (m, 1H), 2.19 (m, 1H), 2.00 (M, 1H), 1.52-1.80 (m=5H), 1.44 (m, 1H), 1.12-1.27 (m, 4H), 0.89 (m, 2H); MS: m/e=492.04;

N-(1-benzooxazol-2-ylcarbonyl-3-phenylpropyl)-3-cyclohexyl-2-methylsulfonlaminopropionamide (Compound 189); ^1H NMR ($CDCl_3$): 7.87 (m, 1H), 7.62 (m, 1H), 7.55 (m, 1H), 7.46 (m, 1H), 7.13-7.28 (m, 5H), 6.79 (d, J=7.9Hz, 1H), 5.71 (m, 1H), 4.92 (m, 1H), 4.00 (m, 1H), 2.95 (2, 3H), 2.75 (m, 2H), 2.48 (m, 1H), 2.21 (m, 1H), 1.78 (m, 1H), 1.61 (m, 5H), 1.45 (m, 1H), 1.16 (m, 4H), 0.89 (m, 2H);

cyclohexylmethyl 1-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamate (Compound 190); ^1H NMR ($CDCl_3$): 7.88 (m, 1H), 7.62 (m, 1H), 7.52 (m, 1H); 7.49 (m, 1H), 7.13-7.23 (m, 5H), 5.57 (m, 1H), 3.89 (d, J=6.5Hz, 2H), 2.79 (m, 2H), 2.42 (m, 1H), 2.12 (m, 1H), 1.50-1.73 (m, 6H), 1.24 (m, 6H), 0.89 (m, 2H); MS: m/e=421.0;

benzyl 1-(1-benzooxazol-2-ylcarbonyl-3-phenylpropylsulfamoylmethyl)-2-methlybutylcarbamate (Compound 191); ^1H NMR ($CDCl_3$): 7.88 (d.J=7.7Hz, 1H), 7.62 (m, 1H), 7.55 (m, 1H), 7.47 (m, 1H), 7.33 (m, 5H), 7.19 (m, 5H), 6.35 (d, J=7.7Hz, 1H), 5.45 (m, 1H), 5.13 (s, 2H), 5.0 (m, 1H), 4.43 (m, 1H), 3.06 (m, 1H), 2.87 (m, 1H), 2.45 (m, 1H), 2.15 (m, 1H), 1.41 (m, 1H), 1.07 (m, 1H), 0.88 (m, 6H); MS: m/e=5.78.1;

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(6-methylpyrid-2-ylmethylsulfonyl)ethyl]thiophene-3-carboxamide (Compound 192);

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl)-2-(2-methylpyrid-3-ylmethylsulfonyl)ethyl]nicotinamide (Compound 193);

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-cyanobenzylsulfonyl)ethyl]azetidine-3-carboxamide (Compound 194);

tert-butyl 1*R*-(1-benzooxazol-2-ylcarbonylcyclobutylcarbamoyl)-2-(2-difluoromethoxybenzy]sulfonyl)ethylcarbamate (Compound 195);

tert-butyl 1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(4-trifluoromethylpyrid-3-ylmethylsulfonyl)ethylcarbamate (Compound 196);

N-[1*R*-(1-benzooxazol-2-ylcarbonylcyclobutylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethylmorpholine-4-carboxamide (Compound 197);

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-pyrid-3-ylmethylsulfonylethyl]isonicotinamide (Compound 198);

methyl 1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-(2-methoxybenzylsulfonyl)ethylcarbamate (Compound 199);

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpropylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide (Compound 200); NMR 300mHz (DMSO-d_6), 8.65 (d, J=7.1H_3, 1H), 8.01 (d, J=8.2H_3, 1H), 7.91 (d, J=8.8H_3, 1H), 7.66 (t, J=8H_3, 1H), 7.55 (t., J=7.7H_3, 1H), 7.38 (s, 5H), 7.05 (d, J=9.4H_3, 1H), 5.21 (m, 1H), 4.75 (m, 1H), 4.49 (s, 2H), 3.53 (m, 4H), 3.45 (m, 2H), 3.32 (m, 4H), 2.02 (m, 1H), 1.77 (m, 1H), 0.96 (t, J=8H_3, 3H); M=543.24 M^+=542.61;

N-(1*R*-benzooxazol-2-ylcarbonylpropy)-2-(3,3-dimethylureido) 3-(2-methoxybenzylsulfonyl)propionamide (Compound 201); NMR 300mHz (DMSO-d_6), 8.61 (d, J=7.4H_3, 1H), 8.01 (d, J=8.5H_3, 1H), 7.90 (d, 3=7.1H_3, 1H), 7.65 (t, J=8H_3, 1H), 7.55 (t, J=8H_3, 1H), 7.33 (m, 2H), 7.05 (d, J=8.8H_3, 1H), 6.96 (t, J=8.2H_3, 1H), 6.70 (d, J=9.1H_3, 1H), 5.20 (m, 1H), 4.53 (d, J=15.4H_3, 1H), 4.41 (d, J=15.4H_3, 1H), 3.77 (s, 3H), 3.45 (d, J=7.1H_3, 2H), 2.81 (s, 6H), 2.0 (m, 1H), 1.7 (m, 1H), 0.96 (t, J=8H_3, 3H); MS=651.33 M^+=650.59;

methyl 1*R*-(1*S*-benzooxazol-2-ylcarbonylpropylcarbamoyl)-2-(2-methoxybenzylsulfonylethyl)carbamate (Compound 202);

N-(1-benzooxazol-2-ylcarbonylpentyl)-2*R*-[3,3-bis(2-methoxyethyl)ureido]-3-pyrid-3-ylmethylsulfonylpropionamide (Compound 203);

N-(1*S*-benzooxazol-2-ylcarbonylpentyl)-2*R*-[3,3-bis(2-methoxyethyl)ureido]-3-(3,5-dimethylisoxazol-4-ylmethylsulfonyl)propionamide (Compound 204);

N-(1*S*-benzooxazol-2-ylcarbonylpropyl)-3-(3,5-dimethylisoxazol-4-ylmethylsulfonyl)-2*R*-methylsulfonylaminopropionamide (Compound 205); ^{1}H NMR: (DMSO) 9.04 (d, J=6.6Hz, 1H), 8.00-7.87 (m, 3H), 7.63 (t, J=8Hz, 1H), 7.53 (t, J=8Hz, 1H), 5.25 (m, 1H), 4.61-4.36 (m, 3H), 3.56-3.31 (m, 2H), 2.91 (s, 3H), 2.36 (s, 3H), 2.17 (s, 3H), 2.02 (m, 1H), 1.74 (m, 1H), 0.96 (t, J=7Hz, 3H); MS: (M^++1) 527;

methyl 1*R*-(1*S*-benzooxazol-2-ylcarbonylpropylcarbamoyl)-2-(3,5-dimethylisoxazol-4-ylmethylsulfonyl)ethylcarbamate (Compound 206); ^{1}H NMR: (DMSO) 8.78 (d, J=5.8Hz, 1H), 7.99 (d, J=8Hz, 1H), 7.87 (d, J=8Hz, 1H), 7.69 (d, J=8.5Hz, 1H), 7.62 (t, J=8Hz, 1H), 7.52 (t, J=8Hz, 1H), 5.20 (m, 1H), 4.68 (m, 1H), 4.39 (d, J=14Hz, 1H), 4.29 (d, J=14Hz, 1H), 3.52 (s, 3H), 3.60-3.28 (m, 2H), 2.37 (s, 3H), 2.15 (s, 3H), 2.02 (m, 1H), 1.74 (m, 1H), 0.95 (t, J=7Hz, 3H); MS: (M^++1) 507;

N-[1*R*-(1-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-pyrid-2-ylmethylsulfonylethyl]isonicotinamide (Compound 207); NMR 1H: 9.15-9.30 (m, 1H), 8.4-8.9 (m, 4 H), 7.32-8.05 (m, 9H), 5.28 (m, 1H), 5.10 (m, 1H), 4.75 (m, 2H), 3.75 (m, 1H), 3.62 (m, 1H), 1.95 (m, 1H), 1.75 (m, 1H), 1.05-1.45 (m, 4H), 0.87 (m, 3H); MS: M+1 = 564.0; and

4-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-pyrid-2-ylmethylsulfonylethylcarbamoyl]pyridine 1-oxide (Compound 208).

REFERENCE 13

Benzyl 1*S*-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate

[0215] A solution of 2-benzyloxycarbonylamino-4-phenylbutyric acid (5.05 g, 16.1 mmol) in methylene chloride (70 mL) was cooled to 0°C and treated with diisopropylethylamine (2.82 mL, 16.2 mmol) added dropwise and then PyBOP® (8.53 g, 16.4 mmol) added in one portion. The mixture was stirred for 5 minutes and then treated with *N,O*-dimethylhydroxylamine hydrochloride (1.73 g, 17.71 mmol) was added in one portion. The mixture was neutralized with diisopropylethylamine (4.6 mL, 26.44 mmol) added dropwise, stirred for 2 hours at room temperature and then diluted with methylene chloride (70 mL). The dilution was washed with 1N aqueous hydrochloric acid (3x 40 mL), saturated sodium bicarbonate (3x 40 mL) and brine (40 mL) and then concentrated. The product was purified from the residue by column chromatography eluting with 2:3 ethyl acetate/hexane to provide benzyl 1*S*-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate (5.48 g, 15.4 mmol) as an oil. MS(PCI) m/z = 357 (M +1).

[0216] Proceeding as in Reference 13 provided *tert*-butyl 1*S*-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate; ^{1}H NMR ($CDCl_3$): δ 1.35 (s, 9H), δ 1.64 - 1.72 (m, 2H), δ 2.40 - 2.54 (m, 1H), δ 2.60 - 2.77 (m, 1H), δ 3.00 (s, 3H) 3.52 (s, 3H), δ 4.23 (m, 1H), δ7.10 - 7.37 (m, 5H).

REFERENCE 14

2*S*-Amino-*N*-methoxy-*N*-methyl-4-phenylbutyramide trifluoroacetic acid salt

[0217] A solution of *tert*-butyl 1-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate (9.32 g, 29 mmol), provided as in Reference 13, in methylene chloride (100 mL) was cooled to 0° C and then treated with anisole (5 mL, 46.5 mmol) and trifluoroacetic acid (50 mL, 296 mmol). The mixture was stirred for 30 minutes, while allowing it to warm to room temperature, and then concentrated. The residue was dissolved in toluene (100 mL) and the solution was concentrated. The residue was again dissolved in toluene (100 ml) and concentrated to provide 2*S*-amino-*N*-methoxy-*N*-methyl-4-phenylbutyramide trifluoroacetic acid salt (9.74 g 29 mmol) as a crude product. MS(PCI) m/z = 223 (M +1).

REFERENCE 15

Benzyl 1-[1-(*N*-methoxy-*N*-methylcarbamoyl)-3*S*-phenylpropylcarbamoyl]-3-methylbutylcarbamate

[0218] A solution comprised of 2*S*-amino-*N*-methoxy-*N*-methyl-4-phenylbutyramide trifluoroacetic acid salt (9.74 g, 29 mmol), provided as in Reference 2, in DMF (75 mL) was cooled to 0° C and then neutralized with diisopropylethylamine added dropwise. A solution comprised of 2,5-dioxopyrrolidin-1-yl 2-benzyloxycarbonylamino-4-methylvalerate (10.50 g, 29 mmol) in DMF (75 mL) and an additional amount of diisopropylethylamine (10.10 mL, 58 mmol) were added to the cooled butyramide solution. The mixture was stirred for 2 hours, while allowing it to warm to room temperature, and then poured into ice water (300 mL). The mixture was let stand for 1 hour to provide a white precipitate. The precipitate was collected by filtration and dried (P_2O_5) under vacuum to provide benzyl 1-[1-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamoyl]-3-methylbulylcarbamate (12.24 g, 26.1 mmol). ^{1}H NMR ($CDCl_3$): δ 0.91 (d, J = 5.88 Hz, 6H), δ 1.45 - 1.55 (m, 1H), 8 1.45 - 1.55 (m, 2H), δ 1.77 - 2.00 (m, 1H), δ 2.11 - 2.22 (m, 1H), δ 2.70 (m, 2H), δ 3.20 (s, 3H) 3.60 (s, 3H) 4.25 (m, 1H), δ 5.00 (m, 1H), δ 5.15 (s, 2H), δ 6.6 (d, J = 8.15 Hz, 1H), δ 7.15 - 7.45 (m, 10H).

REFERENCE 16

Ethyl 3*S*-benzyloxycarbonylamino-2-hydroxy-5-phenylpentanimidate

[0219] A suspension comprised of lithium aluminum hydride (0.885 g, 23.3 mmol) in anhydrous diethyl ether was cooled to -45°C under nitrogen and then treated with a solution of benzyl 1*S*-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamate (5.53 g, 15.53 mmol), provided as in Reference 13, in ether (75 mL) and THF (25 mL) was added dropwise over a period of 30 minutes such that the temperature of the mixture was maintained at -40 to -45°C. The mixture was allowed to warm to 5°C and then recooled to -35°C. A saturated solution of sodium bicarbaonate (7 mL, 0.5 M) was added dropwise and the mixture was allowed to warm to 0°C. The mixture was allowed to warm to room temperature and stirred for 1 hour to provide a precipitate. The precipitate was collected by filtration and washed with ether (100 mL). The filtrate and washings were combined and washed with ice cold 1N hydrochloric acid (2x 50 mL), saturated sodium bicarbonate (2 x 50 mL) and brine (50 mL), dried (Na_2SO_4) and concentrated *in vacuo* to provide benzyl 1*S*-formyl-3-phenylpropylcarbamate (4.01 g, 13.5 mmol) as a colorless oil. MS (PCI) m/z = 298 (M + 1).

[0220] A solution of benzyl 1*S*-formyl-3-phenylpropylcarbamate (4.557 g, 15.3 mmol) in anhydrous methylene chloride (50 mL) was stirred while sequentially treating with 2-hydroxy-2-methylpropionitrile (4.25 mL, 46.2 mmol) and triethylamine (1.28 ml, 9.20 mmol): The mixture was stirred for 4 hours at room temperature and concentrated *in vacuo*. The residue was dissolved in ether (100 mL) and the solution was washed with water (5 x 20 mL) and brine (20 mL), dried ($MgSO_4$) and concentrated to provide benzyl 2-cyano-2-hydroxy-1*S*-phenethylethylcarbamate (4.957 g, 15.3 mmol) as a yellow oil. ^{1}H NMR ($CDCl_3$): δ 1.75 - 2.01 (m, 2H), δ 2.08 - 2.24 (m, 1H), δ 2.51 - 2.80 (m, 2H), δ 3.70 - 4.02 (m, 1H), δ 5.07, δ 5.33 (m, 3H), δ 7.10 - 7.47 (m, 10H).

[0221] A comprised of chloroform (30 mL) and anhydrous ethanol (30 mL, 510 mmol) was cooled to 0° C and then treated with acetyl chloride (32.6 mL, 459 mmol) added dropwise over a period of 30 minutes. The mixture was cooled with solution of crude benzyl 2-cyano-2-hydroxy-1-phenethylethylcarbamate (4.957 g, 15.3 mmol) in chloroform (30 mL). The mixture was stirred for 2 hours at 0°C and then 6 hours at room temperature and concentrated *in vacuo* to provide ethyl 3*S*-benzyloxycarbonylamino-2-hydroxy-5-phenylpentanimidate (6.212 g 15.3 mmol) as a crude yellow oil. MS (PCI) m/z = 371 (M + 1).

REFERENCE 17

2*S*-Amino-4-phenyl-1-(4*S*-phenyl-4,5-dihydrooxazol-2-yl)butan-1-ol

[0222] A mixture comprised of ethyl 3S-benzyloxycarbonylamino-2-hydroxy-5-phenylpentanimidate (0.78 g, 1.92 mmol), provided as in Reference 16, diisopropylethylamine (0.218 µL, 1.26 mmol) and 2*S*-amino-2-phenylethanol (0.260 g, 1.9 mmol) in chloroform (25 mL) was heated at reflux for 3 hours and then was stirred for approximately 12 hours, while allowing to cool to room temperature. The mixture was concentrated and the residue was dissolved in ethyl acetate (50 ml). The solution was washed with 0.5N sodium hydroxide (40 mL) and brine (40 mL), dried ($MgSO_4$) and then concentrated. Product was purified from the residue by flash chromatography eluting with 1:3 hexanes/ethyl acetate to provide benzyl 2-hydroxy-2-(4,5-dihydro-4*S*-phenyloxazol-2-yl)-1*S*-phenyethylethylcarbamate (0.475 g, 1.1 mmol) as an oily mixture of diastereomers. MS (PCI) m/z = 445 (M +1). ($C_{27}H_{28}N_2O_4$).

[0223] A solution comprised of benzyl 2-hydroxy-2-(4,5-dihydro-4*S*-phenyloxazol-2-yl)-1*S*-phenyethylethylcarbamate (100 mg, 0.22 mmol) in methanol (10 mL) was placed under a nitrogen atmosphere and stirred while Pearlman's

catalyst (20 mg) was added. The mixture was stirred vigorously under a hydrogen atmosphere until the reaction was complete and then filtered. The filter was washed with methanol (2 x 25 mL). The combined filtrates were concentrated to provided 2*S*-amino-4-phenyl-1-(4,5-dihydro-4*S*-phenyloxazol-2-yl)butan-1-ol (51 mg, 0.16 mmol) as a clear oil. MS (PCI) m/z = 311(M +1). ($C_{19}H_{22}N_2O_2$).

REFERENCE 18

2*S*-Amino-1-oxazol-2-yl-4-phenylbutan-1-ol

[0224] A solution comprised of oxazole (0.25 g, 3.62 mmol) in THF (20 mL) was treated with borane tetrahydrofuran complex (3.62 mL, 3.62 mmol) under nitrogen and the mixture was stirred for 30 minutes and then cooled to -78°C. A solution comprised of *sec*-butyl lithium (2.78 ml, 3.62 mmol) in cyclohexane was added dropwise and the mixture was stirred for 30 minutes. A solution comprised of *tert*-butyl (*S*)-1-formyl-3-phenylpropylcarbamate (0.476 g, 1.81 mmol) in THF (25 mL) was added and the mixture was stirred and allowed to warm while the reaction proceeded to completion. The mixture then was cooled to -78°C, quenched by slowly adding 5% acetic acid in ethanol (20 mL), allowed to warm to ambient temperature and stirred for 18 hours. The mixture was concentrated to dryness and the residue was extracted with ether (2x25 mL). The combined extracts were washed with brine, dried ($MgSO_4$) and concentrated to dryness to provide *tert*-butyl 2-hydroxy-2-oxazol-2-yl-1*S*-phenethylethylcarbamate (0.125 g, 0.376 mmol) as a yellow oil.
MS (PCI) m/z = 333 (M + 1).

[0225] A mixture comprised of *tert*-butyl 2-hydroxy-2-oxazol-2-yl-1*S*-phenethylethylcarbamate (0.125 g, 0.376 mmol), anisole (0.2 mL) and trifluoroacetic acid (0.6 mL) in methylene chloride (20 mL) was stirred at room temperature for 2 hours and then concentrated to provide 2*S*-amino-1-oxazol-2-yl-4-phenylbutan-1-ol trifluoroacetic acid salt (0.08 g, 0.229 mmol) as a yellow oil. MS (PCI) m/z = 233 (M + 1).

REFERENCE 19

Methyl 2-(2*S*-amino-1-hydroxy-4-phenylbutyl)oxazole-4-carboxylate

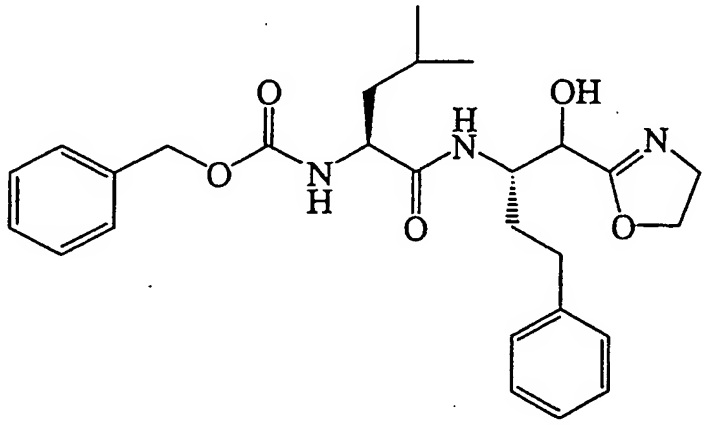
[0226] A solution comprised of methyl 2-(2*S*-benzyloxycarbonylamino-1-hydroxy-4-phenylbutyl)-4,5-dihydrooxazole-4-carboxylate (0.100 g, 0.235 mmol) in methylene chloride (3 mL) was cooled to 0°C and then treated with DBU (39 mL, 0.26 mmol) and bromotrichloromethane (26 ml, 0.26 mmol). The mixture was stirred for 6 hours at 0° C, washed with ammonium chloride (10 mL) and concentrated. The residue was dried ($MgSO_4$) to provide methyl 2-(2S-benzyloxycarbonylamino-1-hydroxy-4-phenylbutyl)oxazole-4-carboxylate.
MS(PCI) m/z = 425 (M +1).

[0227] Deprotecting provided methyl 2-(2S-amino-1-hydroxy-4-phenylbutyl)oxazole-4-carboxylate.

EXAMPLE 19

Benzyl 1*S*-[2-(4,5-dihydrooxazol-2-yl)-2-hydroxy-1*S*-phenethylethylcarbamoyl]-3-methylbutylcarbamate (Compound 210)

[0228]



[0229] A mixture comprised of ethyl 3-(2-benzyloxycarbonylamino-4-methylvalerylamino)-2-hydroxy-5-phenylpentanimidate (0.327 g, 0.63 mmol), diisopropylethylamine (0.218 mL, 1.26 mmol) and ethanolamine (38.4 mg, 0.63 mmol) in chloroform (20 mL) was heated (reflux temperature) for 3 hours and then stirred at room temperature for approximately 12 hours. The mixture was concentrated and the residue was dissolved in ethyl acetate (50 mL). The solution was washed with 0.5 M sodium hydroxide (40 mL) and brine (40 mL), dried ($MgSO_4$) and concentrated *in vacuo*. Product was purified from the residue by flash chromatography eluting with 3:1 ethyl acetate/hexanes to provide benzyl 1*S*-[2-(4,5-dihydrooxazol-2-yl)-2-hydroxy-1*S*-phenethylethylcarbamoyl]-3-methylbutylcarbamate (38 mg, 0.079 mmol) as a white solid. MS (PCI) m/z = 482 (M +1). ($C_{27}H_{35}N_3O_5$).

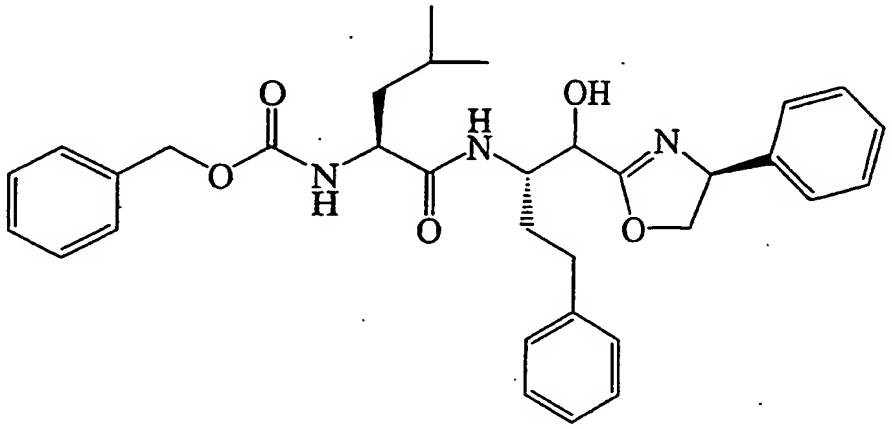
[0230] Proceeding as in Example 19 provided benzyl 1*S*-[2-(1*H*-benzoimidazol-2-yl)-2-hydroxy-1*S*-phenyethylethylcarbamoyl]-3-methylbutylcarbamate (Compound 211);

EXAMPLE 20

Benzyl 1*S*-[2-(4,5-dihydro-4*S*-phenyloxazol-2-yl)-2-hydroxy-1*S*-phenethylethylcarbamoyl]-3-methylbutylcarbamate

(Compound 212)

[0231]



[0232] A solution comprised of 2*S*-amino-4-phenyl-1-(4*S*-phenyl-4,5-dihydrooxazol-2-yl)butan-1-ol (51 mg, 0.165 mmol), provided as in Example 18, in DMF (2 mL) was cooled to 0° C and a second solution comprised of 2,5-dioxopyrrolidin-1-yl 2*S*-benzyloxycarbonylamino-4-methylvalerate (0.063 g, 0.174 mmol) and diisopropylethylamine (30.3 µL, 0.174 mmol) in DMF (3 mL) was added. The mixture was stirred for 2 hours, while allowing to warm to room temperature, and then concentrated. Product was purified from the residue by column chromatography eluting with ethyl 1:1 acetate/hexane to provide benzyl 1*S*-[2-(4,5-dihydro-4*S*-phenyloxazol-2-yl)-2-hydroxy-1*S*-phenethylethylcarbamoyl]-3-methylbutylcarbamate (34 mg, 0.061 mmol) as a clear oil. MS (PCI) m/z = 558(M +1). ($C_{33}H_{39}N_3O_5$).

[0233] Proceeding as in Example 20 provided the following compounds of Formula I:

benzyl 1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethlethylcarbamoyl)-3-methylbutylcarbamate (Compound 213); MS (ESI)m/z = 530 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$,): δ 0.65 - 0.7 (dd, 6H), δ 0.98 (d, J = 6 Hz 2H), δ 1.10 - 1.55 (m, 3H), δ 1.65 - 1.85 (m, 1H), 2.08 (m, 1H), δ 2.70 (m, 2H), δ 3.99 - 4.13 (m, 1H), δ 4.50(m, 1H), δ 4.90 - 5.21 (m, 3H), δ 6.40 - 6.70 (dd, 1H), δ 7.05 - 7.35 (m, 10H), δ 7.47 (d, J = 4 Hz, 2H), δ 7.51 (d, J = 2 Hz, 2H), ($C_{31}H_{35}N_3O_5$);

benzyl 1-[2-(4,5-dihydro-5-phenyloxazol-2-yl)-2-hydroxy-1-phenethylethylcarbamoyl]-3-methylbutylcarbamate (Compound 214);

benzyl 1-[2-(4,5-dihydro-4*S*-methyl-5*S*-phenyloxazol-2-yl)-2-hydroxy-1-phenyethylcarbamoyl]-3-methylbutylcarbamate (Compound 215);

benzyl 3-methyl-1-(2-hydroxy-2-naphtho[2,3-*d*]oxazol-2-yl-1-phenethylethylcarbamoyl}butylcarbamate (Compound 216); MS (ESI) m/z = 580 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.65 - 0.95 (m; 6H), δ 1.25 (m, 3H), δ 1.54 (m, 3H), δ 2.20 (m, 1H), δ 2.82 (t, J = 4 Hz, 2H), δ 4.00 - 4.20 (m, 1H), δ 4.35 - 4.55 (m, 1H), δ 4.90 - 5.09 (m, 3H), δ 6.60 (m, 1H), δ 7.23 (m, 10H), δ 7.56 (m, 2H), δ 7.96 (m, 3H), δ 8.18 (s, 1H), ($C_{35}H_{37}N_3O_5$);

benzyl 1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-methylpropylcarbamate (Compound 217);

benzyl 1*S*-(2-benzooxazol-2-yl-2-hydroxy-1*S*-phenethylethylcarbamoyl)-3-methylbutylcarbamate (Compound 218);

benzyl 1*S*-[2-(4,5-dihydro-4,4-dimethyloxazol-2-yl)-2-hydroxy-1*S*-phenethylethylcarbamoyl]-3-methylbutylcarbamate (Compound 219), MS(PCI) m/z = 510 (M+1); ^{1}H NMR ($CDCl_3$): δ 0.8 - 0.99 (d, J = 6 Hz, 6H), 1.11 - 1.35 (m, 6H), δ 1.4 - 1.78 (m, 3H), δ 1.82 - 2.01 (m, 2H), δ 2.55 - 2.72 (m, 2H), δ 3.95 (m, 1H), δ 4.0 - 4.25 (m, 3H), δ 4.30 (s, 1H), δ 5.10 (s, 2H), δ 5.35 (s, 1H), δ 6.58 (m, 1H) 7.1 - 7.37 (m, 10H); ($C_{29}H_{39}N_3O_5$);

methyl 2-[2-(2-benzyloxycarbonylamino-4-methylvalerylamino)-1-hydroxy-4-phenylbutyl]-4,5-dihydrooxazole-4-carboxylate (Compound 220), MS(PCI) m/z = 540 (M +1); ^{1}H NMR ($CDCl_3$): δ 0.8 - 0.99 (d, J = 6 Hz, 6H), 1.25 (m, 1H), δ 1.47 (m, 1H) 1.65 (m, 2H), δ 1.99 (m, 2H), δ 2.15 (s, 1H), δ 2.65 (t, J = 4Hz, 2H), δ 3.70 (s, 3H) 4.18 (m,

1H), δ 4.25 - 4.50 (m, 3H), δ 4.51 - 4.64 (m, 2H), δ 5.17 (m, 2H), δ 5.35 (d, J = 5Hz, 1H) 6.65 (d, J = 6Hz, 1H), δ 7.17 - 7.45(m, 10H); ($C_{29}H_{37}N_3O_7$);

methyl 2-[2-(2,2-dimethylpropionylamino)-4-phenylbutyryl]oxazole-4-carboxylate (Compound 221); MS (ESI) m/z = 373 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 1.25 (s, 9H), δ 2.20 (m, 1H), δ 2.46 (m, 1H), δ 2.77 (t, J = 4 Hz, 2H), δ 3.99 (s, 3H), δ 5.55 (m, 1H), δ 6.41 (d, J = 4 Hz, 1H), δ 7.20 - 7.38 (m, 5H), δ 8.41 (s, 1H), ($C_{20}H_{24}N_2O_5$);

tert-butyl 4-{1*S*-[2-(5-*tert*-butylbenzooxazol-2-yl)-2-hydroxy-1*S*-phenethylethylcarbamoyl]-3-methylbutylcarbamoyl}piperidine-1-carboxylate (Compound 222);

tert-butyl 4-{1*S*-[2-hydroxy-1*S*-phenethyl-2-(5-sulfamoylbenzooxazol-2-yl)ethylcarbamoyl]-3-methylbutylcarbamoy}piperidine-1-carboxylate (Compound 223);

tert-butyl 4-[1*S*-(2-hydroxy-2-naphtho[1,2-dioxazol-2-yl-1*S*-phenethylethylcarbamoyl)-3-methylbutylcarbamoyl] piperidine-1-carboxylate (Compound 224);

tert-butyl 4-[1*S*-(2-hydroxy-2-naphtho[2,1-*d*]oxazol-2-yl-1*S*-phenethylethylcarbamoyl)-3-methylbutylcarbamoyl] piperidine-1-carboxylate (Compound 225);

tert-butyl 4-{1*S*-[2-hydroxy-1*S*-phenethyl-2-(5-phenylbenzooxazol-2-yl)ethylcarbamoyl]-3-methylbutylcarbamoyl} piperidine-1-carboxylate (Compound 226);

tert-butyl 4-[1*S*-(2-benzooxazol-2-yl)-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-methylbutylcarbamoyllpineridine-1-carboxylate (Compound 227); MS (ESI) m/z = 607 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.50 - 0.61 (m, 1H), δ 0.75 - 0.98 (m, 6H), δ 1.22 (m, 1H), δ 1.41 (s, 9H), δ 1.81 - 1.85 (m, 1H), δ 1.99 - 2.06 (m, 1H), δ 2.70 (m, 2H), 4.24 (d, J = 2 Hz 2H), δ 4.50 - 4.70 (m, 1H), δ 4.99 - 5.14 (m, 2H), δ 6.96 - 7.81 (m, 15H), ($C_{34}H_{46}N_4O_6$);

tert-butyl3-[1*S*-(2-benzooxazol-2-yl)-2-hydroxy-1*S*-phenethylethylcarbamoyl)-2-methylbutylcarbamol]benzylcarbamate (Compound 228);

tert-butyl 4-[1*S*-(2-benzooxazol-2-yl)-2-hydroxy-1*S*-phenethylethylcarbamol)-2-cyclohexylethylcarbamoyl]piperidine-1-carboxylate (Compound 229);

benzyl 3-methyl-1*S*-[2-hydroxy-1*S*-phenethyl-2-(5-phenyloxazol-2-yl)ethylcarbamoyllbutylcarbamate (Compound 230); MS (ESI) m/z = 556 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.75 - 0.95 (m, 6H), δ 1.25 - 1.80 (m, 5H), δ 2.00 (m, 2H), δ 2.67 (m, 2H), δ 4.15 (m, 1H), δ 4.55(m, 1H), δ 4.85 - 5.20 (m, 2H), δ 5.50 (m, 1H), δ 6.80 (d, J = 6Hz, 1H), δ 7.12 - 7.48 (m, 14H), δ 7. 62 (d, J = 2 Hz, 2H), ($C_{33}H_{37}N_3O_5$);

pyrid-3-yl 13-methyl-1 S-[2-hydroxy-1S-phenethyl-2-(5-phenyloxazol-2-yl)ethylcarbamoyl]butylcarbamate (Compound 231); MS (ESI) m/z = 527 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.75 - 0.95 (m, 6H), δ 1.45 - 1.75 (m, 5H), δ 2.00 (m, 2H), δ 2.67 (m, 2H), δ 4.40 - 5.10 (m, 3H), δ 5.60(s, 1H), δ 7.00 - 7.47 (m, 10H), δ 7.62 (m, 2H), δ 8.15 (m, 1H), δ 8.65 (m, 1H), δ 9.15 (m, 1H), ($C_{31}H_{34}N_4O_4$); and

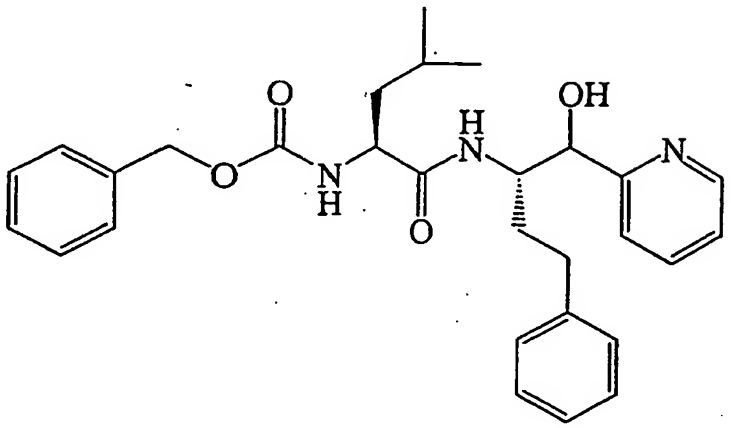
benzyl 1*S*-[2-hydroxy-1*S*-phenethyl-2-(5-phenyloxazol-2-yl)ethylsulfamoylmethyl]-2*R*-methylbutylcarbamate (Compound 232); MS (ESI) m/z = 606 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.75 - 0.95 (m, 6H), δ 1.30 - 1.50 (m, 5H), δ 1.98 (m, 2H), δ 2.77 (m, 3H), δ 3.55 (m, 2H), δ 4.09 (m, 1H), δ 4.90 - 5.10 (m, 3H), δ 5.60 (m, 1H), δ 7.02 - 7.47 (m, 14H), δ 7.62 (m, 2H), ($C_{33}H_{39}N_3O_6S$).

EXAMPLE 21

Benzyl 3-methyl-1*S*-(1*S*-pyrid-2-ylcarbonyl-3-phenylpropylcarbamoyl)butylcarbamate

(Compound 233)

[0234]



[0235] A solution comprised of 2-bromopyridine (0.291 mL, 3.06 mmol) in dry THF (2 mL) was cooled to -78° C and then a solution of n-butyllithium (1.6 mL, 2.72 mmol) in pentane was added dropwise over 2 minutes. The mixture was stirred at -78°C for 10 minutes and then a solution of benzyl 1-[1-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (0.3 g, 0.64 mmol) in THF (2 mL) was added slowly. The mixture was stirred, while allowing to slowly warm to room temperature, and then poured into a solution comprising acetic acid (0.163 mL) in diethyl ether (50 mL). The organic phase was washed with brine (40 mL), dried ($MgSO_4$) and concentrated *in vacuo*. Product was purified from the residue by flash chromatography on silica gel eluting with 1:2 ethyl acetate/hexanes to provide benzyl 3-methyl-1-(1-pyrid-2-ylcarbonyl-3-phenylpropylcarbamoyl)butylcarbamate (82 mg, 0.17 mmol) as a white solid. MS (ESI) m/z = 488 (M + 1); ^{1}H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 4 Hz, 6H), 1.5 (m, 1H), δ 1.6 - 1.78 (t, 2H), δ 1.99 - 2.20 (m, 1H), δ 2.6 - 2.9 (m, 1H), δ 2.55 - 2.85 (m, 2H), δ 4.25 (m, 1H), δ 5.17 (s, 2H), δ 5.25 (m, 1H), δ 6.00 (m, 1H), δ 6.85 - 6.95 (d, J = 10Hz, 1H), δ 7.1 - 7.4 (m, 10H) 7.50(t, J = 4Hz, 1H), δ 7.85 (t, J = 6Hz, 1H) 8.01 (d, J = 8 hz, 1H), δ 8.69 (m, 1H). Anal ($C_{29}H_{33}N_3O_4$).

[0236] Proceeding as in Example 21 provided the following compounds of Formula I:

benzyl 1-[1-(pyrid-3-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 234), MS(PCI) m/z = 488 (M +1); ^{1}H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 4 Hz, 6H) , 1.5 (m, 1H), δ 1.6 - 1.78 (t, 2H), δ 1.80 - 2.01 (m, 2H), δ 2.25 (m, 1H) 2.6 - 2.9 (t, J =3 Hz, 1H), δ 2.55 - 2.85 (m, 2H), δ 4.30 (m, 1H), δ 5.17 (s, 2H), δ 5.35 (d, J = 6Hz, 1H), δ 5.55 (m, 1H), δ 7.02 (d, J = 8Hz, 1H), δ 7.1 - 7.4 (m, 10H) 8.05(d, J =5 Hz, 1H), δ 8.78 (d, J = 4Hz, 1H), δ 9.10 (s, 1H); ($C_{29}H_{33}N_3O_4$); and

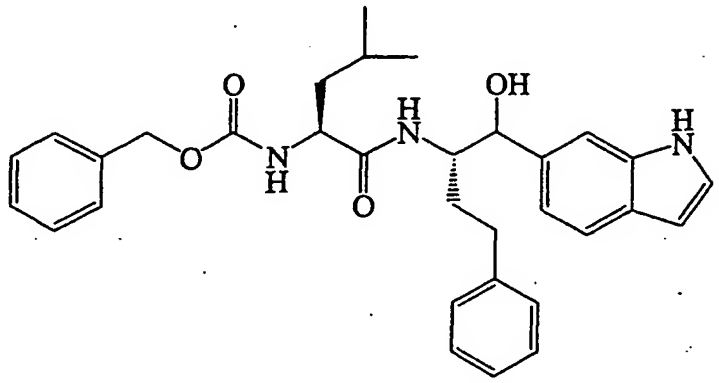
benzyl 1-[1-(quinol-3-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 235), MS(PCI) m/z = 538 (M +1); ^{1}H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 4 Hz, 6H) ,1.5 (m, 1H), δ 1.6 - 1.78 (m, 2H), δ 1.99 - 2.20 (m, 1H), δ 2.6 - 2.9 (m, 1H), δ 2.55 - 2.85 (m, 2H), δ 4.35 (m, 1H), δ 5.17 - 5.25 (m, 3H), δ 5.70 (m, 1H), δ 6.75 - 6.85 (d, J = 10Hz, 1H), δ 7.20 - 7.45 (m, 10H), δ 7.65 (t, J = 6Hz, 1H), δ 7.77 - 7.90 (m, 2H), δ 8.22 (d, J = 7,1H), δ 8.46 (s, 1H), δ 9.4 (s, 1H); ($C_{33}H_{35}N_3O_4$).

EXAMPLE 22

Benzyl 1-[1-(1*H*-indol-5-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate

(Compound 236)

[0237]



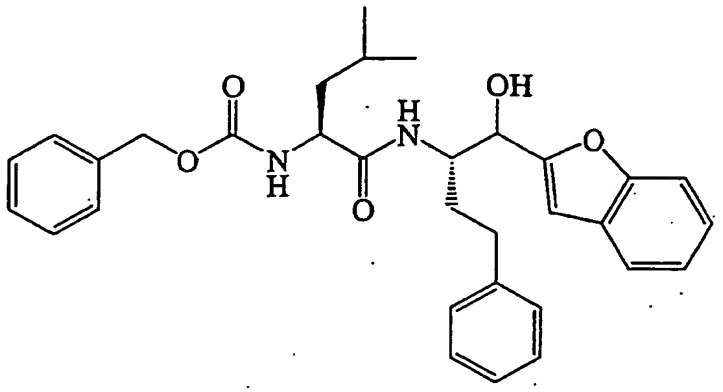
[0238] A mixture comprised of potassium hydride (0.29 g, 2.56 mmol, 67% in mineral oil) in anhydrous ether (5 mL) was cooled to 0° C and then a solution comprised of 5-bromo-1*H*-indole (0.5 g, 2.56 mmol) in anhydrous ether (5 mL) was added. The mixture was stirred for 15 minutes and then cooled to -78° C under nitrogen. A solution comprised of *tert*-butyllithium (3 mL in pentane, 5.08 mmol) in anhydrous ether (5 mL) was cooled to -78° C and added to the indole mixture over 2 minutes. The mixture was stirred for 10 minutes and then a solution comprised of benzyl 1-[1-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (0.3 g, 0.64 mM) in ether (10 mL) was added. The mixture was allowed to warm to room temperature and then poured into a cold solution at 0° C of phosphoric acid (25 mL, 1 M in water). The aqueous layer was separated and extracted with ethyl acetate (25 mL). The organic layers were combined and washed with saturated sodium bicarbonate (25 mL), dried ($MgSO_4$) and concentrated. The product was purified from the residue by flash chromatography on silica gel eluting with 1:2 ethyl acetate/hexanes to provide benzyl 1-[1-(1*H*-indol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (112 mg, 0.21 mmol) as a white solid. MS (ESI) m/z = 526(M + 1); ^{1}H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 4 Hz, 6H), 1.5 (s, 1H), δ 1.5 - 1.78 (m, 3H), δ 2.00 (m, 1H), δ 2.4 (m, 1H), δ 2.65 (m, 2H), δ 4.35 (m, 1H), δ 5.17 (s, 2H), δ 5.25 (d,J = 6 Hz 1H), δ 5.75 (m, 1H), δ 6.55 (s, 1H) 7.05 (d, J = 4Hz, 1H), δ 7.1 - 7.45 (m, 10H) 7.7(d, J = 4Hz, 1H), δ 8.15 (d, J = 4Hz, 1H) 8.78 (m, 1H). ($C_{32}H_{35}N_3O_4$).

EXAMPLE 23

benzyl 1-[1-(benzofur-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate

(Compound 237)

[0239]



[0240] A solution comprised of benzofuran (0.302 g, 2.56 mmol) in anhydrous ether (5 mL) was cooled to -15° C under a nitrogen atmosphere and then a solution of n-butyllithium (1.6 mL in hexanes) was added dropwise over 2 minutes. The mixture was stirred for 1 hour and then a solution comprised of benzyl 1-[1-(*N*-methoxy-*N*-methylcarbamoyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (0.3 g, 0.64 mmol) in diethyl ether was added. The mixture was stirred at -15 ° C until the reaction was complete. The mixture was quenched with a solution of acetic acid (0.153 mL) in diethyl ether (50 mL). The organic phase was washed with brine (40.mL), dried ($MgSO_4$) and concentrated *in vacuo*. The product was purified from the residue by flash chromatography eluting with 2:3 ethyl acetate/hexanes to provide benzyl 1-[1-(benzofur-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (70 mg, 0.13 mmol) as a white solid. ^{1}H NMR ($CDCl_3$): δ 0.8 - 0.99 (d, J = 4 Hz, 6H), 1.5 (m, 1H), δ 1.6 - 1.72 (m, 2H), δ 1.99 - 2.18 (m, 1H), δ 2.22 - 2.41 (m, 1H), δ 2.6 - 2.75 (m, 2H), δ 4.21 (m, 1H), δ 5.01 (m, 1H), δ 5.17 (s, 2H), δ 5.50 (m, 1H), δ 6.75 - 6.81 (d, J = 7 Hz, 1H), δ 7.10 - 7.37 (m, 11H) 7.4 - 7.59(m, 3H), δ 7.64 (d, J = 7 Hz, 1H). ($C_{32}H_{34}N_2O_5$).

[0241] Proceeding as in Example 23 provided the following compounds of Formula I:

benzyl 1-[1-(benzothiazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 238), ^{1}H NMR ($CDCl_3$): δ 0.91 (d, J = 5.88 Hz, 6H), δ 1.39 - 1.54 (m, 1H), δ 1.60 - 1.72 (m, 2H), δ 2.11 - 2.25 (m, 1H), δ 2.40 - 2.54 (m, 1H), δ 2.72 (m, 2H), δ 4.21 (m, 1H), δ 5.10 (s, 3H), δ 5-84 (m, 1H), δ 6.87 (d, J = 8.15 Hz, 1H), δ 7.10 - 7.40 (m, 10H), δ 7.54 (dt, J = 1.62, 8.10 Hz, 1H), δ 7.58 (dt, J = 1.46, 7.80 Hz, 1H), δ 7.97 (dd, J = 1.80, 8.15 Hz, 1H), δ 8.17 (dd, J = 1.66,7.67 Hz, 1H);
benzyl 3-methyl-1*S*-(3-phenyl-1*S*-thiazol-2-ylcarbonylpropylcarbamoyl)butylcarbamate (Compound 239);
N-[3-methyl-1*S*-(3-phenyl-1*S*-thiazol-2-ylcarbonylpropylcarbamoyl)butyl]-4-methylpiperazine-1-carboxamide (Compound 240);
tert-butyl 4-[3-methyl-1*S*-(3-phenyl-1*S*-thiazol-2-ylcarbonylpropylcarbamoyl)butylcarbamoyl]piperazine-1-carboxylate (Compound 241);
benzyl 3-methyl-1*S*-(3-phenyl-1*S*-thien-2-ylcarbonylpropylcarbamoyl)butylcarbamate (Compound 242);
benzyl 1*S*-[1*S*-(1-methyl-1*H*-imidazol-2-ylcarbonyl-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 243);
benzyl 1*S*-(1*S*-thiazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-methylpropylcarbamate (Compound 244);
N-[3-methyl-1*S*-(3-phenyl-1*S*-thiazol-2-ylcarbonylpropylcarbamoyl)butyl]piperazine-1-carboxamide (Compound 245);
benzyl 1*S*-[1*S*-(4-methylthiazol-2-ylcarbonyl)-3-phenylnropylcarbamoyl]-3-methylbutylcarbamate (Compound 246);
benzyl 1*S*-(1*S*-furyl-2-ylcarbonyl-3-phenylpropylcarbamoyl)-3-methylbutylcarbamate (Compound 247), ^{1}H NMR ($CDCl_3$): δ 0.91 (d, J = 6.18 Hz, 6H), δ 1.42 - 1.70 (m, 3H), δ 1.98 - 2.13 (m, 1H), δ 2.19 - 2.37 (m, 1H), δ 2.69 (t, J = 7.60 Hz, 2H), δ 4.22 (m, 1H), δ 5.10 (d, J = 7.76 Hz, 1H), δ 5.12 (s, 2H), δ 5.54 (m, 1H), δ 6.76 (d, J = 8.15 Hz, 1H), δ 7.16 - 7.36 (m, 10H), δ 7.39 (dt, J = 1.82, 7.86 Hz, 1H), δ 7.47 (dt, J = 1.63, 7.79 Hz, 1H), δ 7.69 (s, 1H), δ

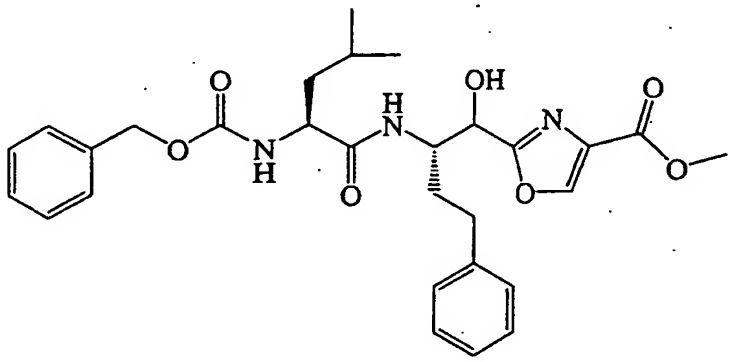
7.80 (d, J = 7.15 Hz, 1H), δ 7.85 (d, J = 8.18 Hz, 1H);
benzyl 1*S*-[1*S*-(1-benzyl-1*H*-imidazol-2-ylcarbonyl-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 248);
benzyl 3-phenyl-1-(4,5-dihyydro-4*S*-phenyloxazol-2-ylcarbonyl)propyl]carbamate (Compound 249);
benzyl 3-phenyl-1-(4,5-dihydro-5-phenyloxazol-2-ylcarbonylpropyl]carbamate (Compound 250);
benzyl [1-(4.5-dihydro-4*S*-methyl-5*S*-phenyloxazol-2-ylcarbonyl)-3-phenylpropyl]carbamate (Compound 251); and
ethyl 2-[2-(2-benzyloxycarbonylamino-4-methylvalerylamino)-4-phenylbutyryl]thiazole-4-carboxylate (Compound 252).

EXAMPLE 24

Methyl 2-[2-(2-benzyloxycarbonylamino-4-methylvalerylamino)-1-hydroxy-4-phenylbutyl]oxazole-4-carboxylate

(Compound 253)

[0242]



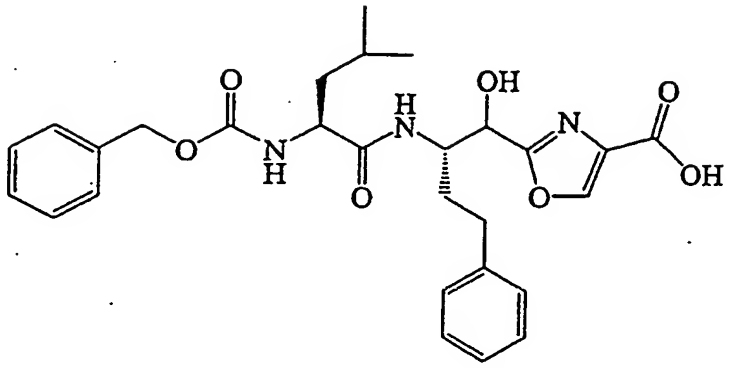
[0243] A solution comprised of methyl 2-[2-(2-benzyloxycarbonylamino-4-methylvalerylamino)-1-hydroxy-4-phenylbutyl]-4,5-dihydrooxazole-4-carboxylate (0.036 g, 0.067 mmol) in methylene chloride (3 mL) was cooled to 0°C and then DBU (11.2 mg, 72.7 μmol) and bromotrichloromethane (14.6 mg, 73.7 μmol) were added. The mixture was stirred for 6 hours at room temperature and concentrated. The residue was dissolved in ethyl acetate (20 mL) and the solution was dried ($MgSO_4$) and concentrated. The product was purified from the residue by flash chromatography eluting with 1:3 hexanes/ethyl acetate to provide methyl 2-[2-(2-benzyloxycarbonylamino-4-methylvalerylamino)-1-hydroxy-4-phenylbutyl]oxazole-4-carboxylate (12 mg, 0.022 mmol) as a white solid. MS(PCI) m/z = 538 (M +1) ^{1}H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 4 Hz, 6H), δ 1.55 - 1.70 (m, 3H), δ 2.00 (m, 1H), δ 2.40 (m, 1H), δ 2.69 (m, 2H), δ 3.99 (m, 3H) 4.45 (m, 1H), δ 5.17 (s, 2H), δ 5.78 (m, 1H), δ 7.01 (d, J = 4Hz 1H), δ 7.14 - 7.47 (m, 10H) 7.72(d, J = 4Hz, 1H), δ 8.40 (s, 1H). ($C_{29}H_{35}N_3O_7$).

EXAMPLE 25

2-[2-(2-Benzyloxycarbonylamino-4-methylvalerylamino)-1-hydroxy-4-phenylbutyl]oxazole-4-carboxylic acid

(Compound 254)

[0244]



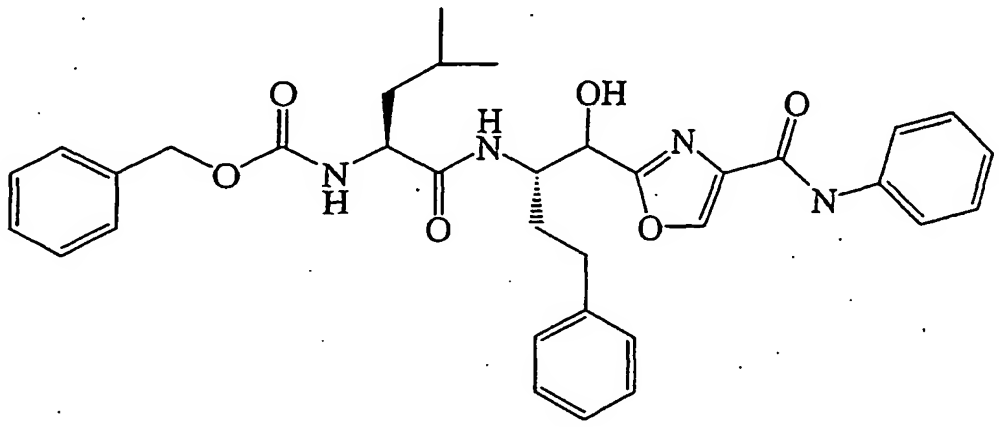
[0245] A mixture comprised of methyl 2-[2-(2-benzyloxycarbonylamino-4-methylvalerylamino)-1-hydroxy-4-phenylbutyl]oxazole-4-carboxylate (2.16 g, 4.02 mmol), provided as in Example 18, and sodium hydroxide (0.815 mL, 1.63 M in water) in methanol (10 mL) was stirred for approximately 12 hours at room temperature, acidified with 1 M hydrochloric acid and concentrated. The residue was dissolved in ethyl acetate (50 mL) and the solution dried ($MgSO_4$). The product was recrystallized from methanol and ether to provide 2-[2-(2-benzyloxycarbonylamino-4-methylvalerylamino)-1-hydroxy-4-phenylbutyl]oxazole-4-carboxylic acid (1.77 g, 3.38 mmol) as an off white solid.

EXAMPLE 26

Benzyl 3-methyl-1-[2-hydroxy-1-phenethyl-2-(4-phenylcarbamoyloxazol-2-yl)ethylcarbamoyl]butylcarbamate

(Compound 255)

[0246]



[0247] A solution comprised of 2-[2-(2-benzyloxycarbonylamino-4-methylvalerylamino)-1-hydroxy-4-phenylbutyl]oxazole-4-carboxylic acid (0.05 g, 0.096 mmol), provided as in Example 7, in DMF (5 mL) was stirred while PyBOP® (0.05 g, 0.096 mmol) and aniline (9 mg, 0.096 mmol) were added. The mixture was stirred for an additional 2 minutes

and diisopropylethylamine (12.4 mg, 0.096 mmol) was added. The mixture was stirred for 2 hours at room temperature, poured into cold water 0°C at and extracted with ethyl acetate (4 x 30mL). The extracts were combined, dried ($MgSO_4$) and then concentrated. The product was purified from the residue by flash chromatography eluting with 1:2 hexanes/ ethyl acetate to provide benzyl 3-methyl-1-[2-hydroxy-1-phenethyl-2-(4-phenylcarbamoyloxazol-2-yl)ethylcarbamoyl] butylcarbamate (30 mg, 0.05 mmol) as a white solid. MS (ESI)) m/z = 599 (M + 1); ^1H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 4 Hz, 6H), 1.35 (m, 1H), δ 1.55 (m, 1H), δ 2.00 - 2.15 (m, 2H), δ 2.62 (m, 2H), δ 2.80 (m, 2H), δ 3.65 (m, 2H), δ 4.11 (m, 1H), δ 4.30 (m, 1H), δ 4.45 (m, 1H), δ 4.95 (s, 1H) 5.17 (s, 2H), δ 5.2 (d, J =4Hz, 1H), δ 6.70 (d, J = 5Hz 1H), δ 7.1 - 7.45 (m, 15H) 7.7(d, J = 4Hz, 1H), δ 8.19 (s, 1H), δ 8.99 (s, 1H). ($C_{34}H_{38}N_4O_6$).

[0248] Proceeding as in Example 26 provided the following compounds of Formula I:

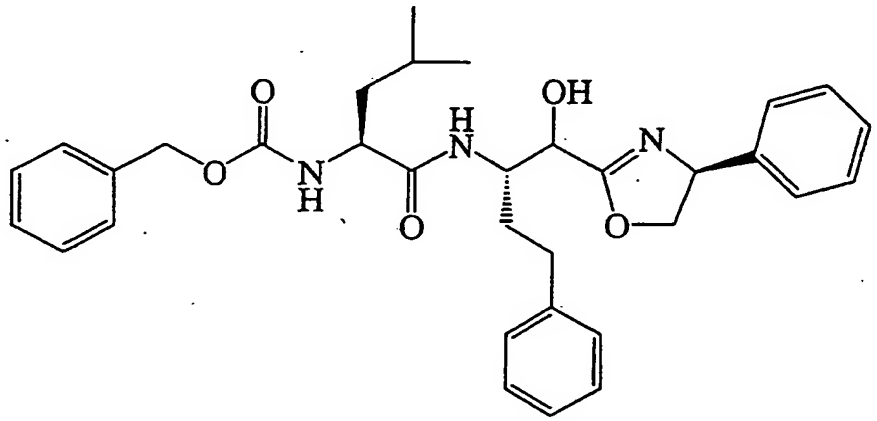
benzyl 1-[2-(4-benzylcarbamoyloxazol-2-yl)-2-hydroxy-1-phenethylethylcarbamoyl]-3-methylbutylcarbamate (Compound 256), MS (ESI)) m/z = 613 (M + 1); ^1H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 4 Hz, 6H), δ 1.25 - 1.75 (m, 3H), δ 2.00 - 2.20 (m, 2H), δ 2.69 (m, 2H), δ 3.85 (m, 1H), δ 3.95 (m, 1H), δ 4.25 (m, 1H), δ 4.60 (m, 2H), δ 4.80 (s, 1H), δ 5.17 (s, 2H), δ 5.59 (m, 1H), δ 6.59 (d, J = 4Hz 1H), δ 7.05 - 7.47 (m, 15H), δ 8.20 (s, 1H); ($C_{35}H_{40}N_4O_6$); and benzyl 3-methyl-1-[2-hydroxy-1-phenethyl-2-(4-phenyethylcarbamoyloxazol-2-yl)ethylcarbamoyl]butylcarbamate (Compound 257), MS (ESI)) m/z = 627 (M + 1); ^1H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 4 Hz, 6H), δ 1.25 - 1.75 (m, 4H), δ 2.00 (m, 2H), δ 2.59 (m, 2H) 2.88 (m, 2H), δ 3.65 (m, 2H), δ 4.02 (m, 1H), δ 4.25 (m,1H), δ 4.80 (s, 1H), δ 5.17 (s, 2H), δ 6.59 (d, J = 4 Hz, 1H), δ 7.00 - 7:42 (m, 15H), δ 8.20 (S' 1H); ($C_{36}H_{42}N_4O_6$).

EXAMPLE 27

benzyl 1-[1-(4,5-dihydro-4*S*-phenyloxazol-2-ylcarbonyl)-3-henylpropylcarbamoyl]-3-methylbutylcarbamate

(Compound 258)

[0249]



[0250] A solution comprised of benzyl 1*S*-[2-(4,5-dihydro-4*S*-phenyloxazol-2-yl)-2-hydroxy-1*S*-phenethylethylcarbamoyl]-3-methylbutylcarbamate (0.038 g, 0.078 mmol), provided as in Example 14, and Dess-Martin Periodinane (0.031 g, 0.072 mmol) in methylene chloride (5 mL) was stirred while a mixture of 0.001:1 methylene chloride/water (2 mL) was slowly added. The mixture was stirred until the reaction was complete and then concentrated. The residue was dissolved in ethyl acetate (50 mL) and the solution was washed with saturated sodium bicarbonate (40 mL), sodium thiosulfate (40 mL, 10% wt/wt), water (40 mL) and brine (40 mL), dried ($MgSO_4$) and then concentrated. Product was purified from the residue by flash chromatography eluting with 3:1 ethyl acetate/hexanes to provide benzyl 1-[1-(4,5-dihydro-4S-phenyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (0.014g, 37.5%) as a white solid. MS (PCI) m/z = 556 (M+1)^1H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 6 Hz, 6H), δ 1.4 - 1.78 (m, 3H), δ 1.87 - 2.12 (m, 1H), δ 2.40 (m, 1H), δ 2.65(t, J = 4Hz, 2H), δ 4.25 (t, J = 3Hz, 2H), δ 4.75 (t, J = 4 Hz, 1H), δ 5.10 (s, 2H), δ 5.40(d J = 3Hz, 1H), δ 5.50 (t, J = 4 Hz, 1H), δ 6.97 (d, J = 3Hz, 1H) 7.1 - 7.49(m, 15H). ($C_{33}H_{37}N_3O_5$).

[0251] Proceeding as in Example 27 provided the following compounds of Formula I:

benzyl 1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-3-methylbulylcarbamate (Compound 259); benzyl 1*S*-[1*S*-(4,5-dihydrooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound

260), MS (PCI) m/z = 480 (M +1) ^{1}H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 6 Hz, 6H), δ 1.4 - 1.78 (m, 3H), δ 1.82 - 2.01 (m, 2H), δ 2.65 (t, J = 5 Hz 2H), δ 2.99 (t, J = 4Hz, 1H), δ 3.75 (d, J = 3Hz,1H), δ 4.10 - 4.35 (m, 3H), δ 4.50 (m, 1H), δ 5.17 (s, 3H), δ 6.85 (s, 1H), δ 7.1 - 7.49(m, 10H), ($C_{27}H_{33}N_3O_5$);

N-[3-methyl-1*S*-(3-phenyl-1*S*-benzooxazol-2-ylcarbonylpropylcarbamoyl)butyl]piperidine-4-carboxamide (Compound 261), ^{1}H NMR (DMSO-d_6): δ 0.83 (d, J = 6.91 Hz, 6H), δ 1.34 - 1.87 (m, 7H), δ 1.92 - 2.07 (m, 1H), δ 2.20 - 2.33 (m, 1H), δ 2.41 - 2.54 (m, 1H), δ 2.62 - 2.92 (m, 4H), δ 3.26 (bd, J = 12.12 2H), δ 4.39 (m, 1H), δ 5.18 (m, 1H), δ 7.16 - 7.33 (m, 5H), δ 7.54 (t, J = 7.64 Hz, 1H), δ 7.64 (t, 7.82 Hz, 1H), δ 7.87 (d, J = 8.40 Hz, 1H), δ 7.96 (d, J = 7.67 Hz, 1H), δ 8.07 (d, J = 8.15 Hz, 1H), δ 8.29 (bs, 1H), δ 8.60 (bs, 1H), δ 8.76 (d, J = 6.45 Hz, 1H);

benzyl 1-[1-(4,5-dihydro-5-phenyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]3-methylbutylcarbamate (Compound 262);

benzyl 1-[1-(4,5-dihydro-5*S*-phenyl-4*S*-methyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl)-3-methylbutylcarbamate (Compound 263);

benzyl 1*S*-(1*S*-phenethyl-2-benzimidazol-2-yl-1-oxoethylcarbamoyl)-3-methylbutylcarbamate (Compound 264), ^{1}H NMR ($CDCl_3$): δ 0.82 - 0.96 (m, 6H), δ 1.44 - 1.75 (m, 3H), δ 2.17 - 2.32 (m, 1H), δ 2.43 - 2.56 (m, 1H), δ 2.61 - 2.80 (m, 2H), δ 4.55 (m, 1H), δ 5.13 (m, 2H), δ 5.35 (d, J = 8.67 Hz, 1H), δ 5.70 - 5.88 (m, 1H), δ 7.00 - 7.42 (m, 14H), δ 7.50 - 7.83 (m, 2H);

benzyl 1-[1-(naphtho[2,3-*d*]oxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 265);

methyl 2-[2-(2-benzyloxycarbonylamino-4-methylvalerylamino)-4-phenylbutyryl]-4,5-dihydrooxazole-4-carboxylate (Compound 266), MS(PCI) m/z = 538 (M +1); ^{1}H NMR ($CDCl_3$): δ 0.8 - 0.99 (d, J = 6 Hz, 6H), 1.25 (m, 1H), δ 1.47 (m, 1H) 1.65 (m, 3H), δ 1.99 (m, 1H), δ 2.35 (m, 1H), δ 2.65 (m, 2H), δ 3.70 (m, 3H) 4.18 (m, 2H), δ 4.55 (m, 1H), δ 5.17 (s, 2H), δ 5.35 (m, 1H) 6.75 (m, 1H), δ 7.17 - 7.45(m, 10H), ($C_{29}H_{35}N_3O_7$);

benzy] 1*S*-[1*S*-(4,5-dihydro-4,4-dimethyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 267), MS(PCI) m/z = 508 (M +1); ^{1}H NMR ($CDCl_3$): δ 0.8 - 0.99 (d, J = 6 Hz, 6H), δ 1.36 (s, 6H), δ 1.5 (m, 1H), δ 1.65 (m, 2H) 1.82 - 2.01 (m, 1H), δ 2.35 (m, 1H), δ 2.6 (t, J = 6 Hz, 2H), δ 4.05 (s, 2H), δ 4.25 (m, 2H); δ 5.10 (s, 2H), δ 5.4 (m, 1H), δ 6.75 (d J = 8Hz, 1H) 7.1 - 7.38(m, 10H); ($C_{29}H_{37}N_3O_5$);

benzyl 1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-methylpropylcarbamate (Compound 268), ^{1}H NMR ($CDCl_3$): δ 0.90 (d, J = 6.91 Hz, 3H), δ 0.97 (d, J = 6.94 Hz, 3H), δ 2.06 - 2.25 (m, 2H), δ 2.38 - 2.55 (m, 1H), δ 2.74 (m, 2H), δ 4.03 (dd, J = 1.73, 6.45 Hz, 1H), δ 5.10 (s, 2H), δ 5.29 (d, J = 8.67 Hz, 1H), δ 5.73 (m, 1H), δ 6.66 (d, J = 7.42 Hz, 1H), δ 7.09 - 7.40 (m, 10H), δ 7.46 (dt, J = 1.62, 8.10 Hz, 1H), δ 7.55 (dt, J = 1.83, 7.76 Hz, 1H), δ 7.64 (d, J = 8.06 Hz, 1H), δ 7.89 (d, J = 7.46 Hz, 1H);

benzyl 1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenypropylcarbamol)-2-methylbutylcarbamate (Compound 269), ^{1}H NMR ($CDCl_3$): δ 0.88 (t, J = 7.43 Hz, 3H), δ 0.91 (d, J = 6.67 Hz, 3H), δ 1.04 - 1.21 (m, 1H), δ 1.40 - 1.55 (m, 1H), δ 1.78 - 1.93 (m, 1H), δ 2.10 - 2.24 (m, 1H), δ 2.40 - 2.54 (m, 1H), δ 2.74 (t, J = 7.60 Hz, 2H), δ 4.06 (t, J = 6.21 Hz, 1H), δ 5.09 (s, 2H), δ 5.29 (d, J = 8.67 Hz, 1H), δ 5.72 (m, 1H), δ 6.66 (d, J = 8.00 Hz, 1H), δ 7.09 - 7.39 (m, 10H), δ 7.46 (dt, J = 1.68, 7.80 Hz, 1H), δ 7.55 (dt, J = 1.44, 7.56 Hz, 1H), δ 7.63 (d, J = 8.04 Hz, 1H), δ 7.89 (d, J = 7.82 Hz, 1H);

benzyl 1*S*-[1*S*-(5-chlorobenzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 270), ^{1}H NMR ($CDCl_3$): δ 0.90 (m, 6H), δ 1.39 - 1.53 (m, 1H), δ 1.59 - 1.70 (m, 2H), δ 2.07 - 2.21 (m, 1H), δ 2.37 - 2.52 (m, 1H), δ 2.73 (t, J = 7.91 Hz, 2H), δ 4.20 (m, 1H), δ 5.06 (d, J = 7.91 Hz, 1H), δ 5.10 (s, 2H), δ 5.64 (m, 1H), δ 6.77 (d, J = 7.67 Hz, 1H), δ 7.09 - 7.37 (m, 10H), δ 7.53 (dq, J = 1.86, 8.91 Hz, 2H), δ 7.89 (d, J = 1.73 Hz, 1H);

N-{3-methyl-1*S*-[3-phenyl-1*S*-(5-chlorobenzooxazol-2-ylcarbonyl)propylcarbamoyl]butyl}peridine-4-carboxamide (Compound 271);

N-[2-cyclohexyl-1*S*-(3-phenyl-1*S*-benzooxazol-2-ylcarbonylpropylcarbamoyl)ethyl]piperidine-4-carboxamide (Compound 272); MS (ESI) m/z = 545 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$, CD_3OD): δ 0.85 (m, 2H), δ 1.02 - 1.58 (m, 4H), δ 1.40 - 1.71 (m, 7H), δ 1.75 - 2.21 (m, 5H), δ 2.38 (m, 1H), 8 2.51 (m, 1H), δ 2.69 (t, J = 4 Hz, 2H), δ 3.32 (m, 2H), δ 4.39 (q, J = 6 Hz 1H), δ 5.53 (q, J = 3 Hz 1H), δ 7.11 - 7.21 (m, 5H), δ 7.24 (s, 1H),δ 7.38 - 7.61 (m, 3H), 8 7.73 (d, J = 6 Hz, 1H), δ 7.82(d, J = 6 Hz, 1H), ($C_{32}H_{40}N_4O_4$);

methyl 2-(2-benzyloxycarbonylamino-4-methylvalerylaminol-4-phenylbutyryloxazole-4-carboxylate (Compound 273);

benzyl 1-[1-(4-phenylcarbamoyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 274), MS (ESI)) m/z = 597 (M + 1); ^{1}H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 4 Hz, 6H), δ 1.55 (m, 1H), δ 1.70 (s, 2H), δ 2.00 - 2.20 (m, 1H), δ 2.40 (m, 1H), δ 2.69 (m, 2H), δ 2.97 (t, J = 4 Hz, 2H), δ 3.70(q, J = 3 Hz, 2H) 4.25 (m, 1H), δ 5.17 (s, 2H), δ 5.59 (m, 1H), δ 6.99 (d, J = 4Hz 1H), δ 7.14 - 7.47 (m, 15H) 7.72(d, J = 4Hz, 1H), δ 8.47 (s, 1H), δ 8.65 (s, 1H), ($C_{34}H_{36}N_4O_6$);

benzyl 1-[1-(4-benzylcarbamoyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 275), MS (ESI)) m/z = 611 (M + 1); ^{1}H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 4 Hz, 6H), δ 1.45 - 1.70 (m, 4H),

δ 2.00 - 2.20 (m, 1H), δ 2.40 (m, 1H), δ 2.69 (m, 2H), δ 4.25 (m, 1H), δ 4.67 (t, J = 3 Hz, 2H), δ 5.17 (m, 3H), δ 5.59 (m, 1H), δ 6.85 (d, J = 4Hz 1H), δ 7.10 - 7.47 (m, 15H), δ 8.47 (s, 1H), ($C_{35}H_{38}N_4O_6$);

tert-butyl 4-{1*S*-[1*S*-(5-*tert*-butylbenzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamoyl} piperidine-1-carboxylate (Compound 276), ^{1}H NMR ($CDCl_3$): δ 0.86 - 0.97 (m, 6H), δ 1.34 - 1.85 (m, 7H), δ 1.38 (s, 9H), δ 1.43 (s, 9H), δ 2.09 - 2.30 (m, 2H), δ 2.37 - 2.52 (m, 1H), δ 2.72 (m, 4H), δ 4.11 (bd, J = 12.85, 2H), δ 4.49 (m, 1H), δ 5.66 (m, 1H), δ 5.97 (d, J = 7.91 Hz, 1H), δ 6.89 (d, J = 7.67 Hz, 1H), δ 7.11 - 7.27 (m, 5H), δ 7.50 - 7.64 (m, 2H), δ 7.86 (d, J = 1.56 Hz, 1H);

tert-butyl 4-{1*S*-[1*S*-(5-sulfamoylbenzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamoyl} piperidine-1-carboxylate (Compound 277), ^{1}H NMR ($CDCl_3$): δ 0.85 - 0.96 (m, 6H), δ 1.37 - 1.82 (m, 7H), δ 1.42 (s, 9H), δ 2.08 - 2.46 (m, 3H), δ 2.71 (m, 4H), δ 4.02 (bs, 2H), δ 4.56 (m, 1H), δ 5.38 (bs, 1H), δ 5.78 (bs, 2H), δ 6.38 (d, J = 8.42 Hz, 1H), δ 7.07 - 7.25 (m, 5H), δ 7.70 (dd, J = 3.48, 8.64 Hz, 1H), δ 8.08 (dd, J = 1.73, 8.67 Hz, 1H), δ 8.41 (dd, J = 1.49, 3.96 Hz, 1H);

N-{3-methyl-1*S*-[3-phenyl-1*S*-(5-*tert*-butylbenzooxazol-2-ylcarbonyl)propylcarbamoyl]butyl}piperidine-4-carboxamide (Compound 278), ^{1}H NMR (DMSO-d_6): δ 0.82 (t, J = 6.18 Hz, 6H), δ 1.36 (s, 9H), δ 1.33 - 1.88 (m, 7H), δ 1.91 - 2.06 (m, 1H), δ 2.19 - 2.34 (m, 1H), δ 2.42 - 2.54 (m, 1H), δ 2.61 - 2.92 (m, 4H), δ 3.27 (bd, J = 12.02 2H), δ 4.39 (m, 1H), δ 5.19 (m, 1H), δ 7.15 - 7.33 (m, 5H), δ 7.74 (dq, J = 1.97, 7.91 Hz, 2H), δ 7.90 (d, J = 1.83 Hz, 1H), δ 8.07 (d, J = 8.15 Hz, 1H), δ 8.27 (bs, 1H), δ 8.56 (bs, 1H), δ 8.72(d, J = 6.43 Hz, 1H);

N-{3-methyl-1*S*-[3-phenyl-1*S*-(5-sulfamoylbenzooxazol-2-ylcarbonyl)propylcarbamoyl]butyl}piperidine-4-carboxamide (Compound 279), ^{1}H NMR (DMSO-d_6): δ 0.80 - 0.88 (m, 6H), δ 1.31 - 1.86 (m, 7H), δ 1.92 - 2.05 (m, 1H), δ 2.22 - 2.33 (m, 1H), δ 2.41 - 2.52 (m, 1H), δ 2.63 - 2.89 (m, 4H), δ 3.26 (bd, J = 11.88 2H), δ 4.40 (m, 1H), δ 5.13 (m, 1H), δ 7.16 - 7.31 (m, 5H), δ 7.57 (s, 2H), δ 8.05 (m, 3H), δ 8.25 (bs, 1H), δ 8.32 (s, 1H), δ 8.55 (bs, 1H), δ 8.82 (d, J = 6.18 Hz, 1H), δ 8.88 (d, J = 6.84 Hz, 1H);

tert-buyl4-{1*S*-(1*S*-naphtho[1,2-*d*]oxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-3-methylbulylcarbamoyl]piperidine-1-carboxylate (Compound 280),^{1}H NMR ($CDCl_3$): δ 0.87 - 0.95 (m, 6H), δ 1.39 - 1.85 (m, 7H), δ 1.44 (s, 9H), δ 2.13 - 2.32 (m, 2H), δ 2.45 - 2.60 (m, 1H), δ 2.65 - 2.81 (m, 4H), δ 4.12 (m, 2H), δ 4.53 (m, 1H), δ 5.79 (m, 1H), δ 6.00 (d, J = 7.94 Hz, 1H), δ 6.90 (d, J = 7.67 Hz, 1H), δ 7.12 - 7.26 (m, 5H), δ 7.56 - 7.80 (m, 3H), δ 7.93 - 8.00 (m, 2H), δ 8.52 (dd, J = 1.97, 8.00 Hz, 1H);

tert-butyl 4-[1*S*-(1*S*-naphtho[2.1-*d*]oxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-3-methylbutylcarbamoyl]piperidine-1-carboxylate (Compound 281), ^{1}H NMR ($CDCl_3$): δ 0.88 - 0.97 (m, 6H), δ 1.38 - 1.86 (m, 7H), δ 1.43 (s, 9H), δ 2.15 - 2.31 (m, 2H), δ 2.43 - 2.57 (m, 1H), δ 2.67 - 2.79 (m, 4H), δ 4.11 (m, 2H), δ 4.52 (m, 1H), δ 5.73 (m, 1H), δ 5.96 (d, J = 7.94 Hz, 1H), δ 6.90 (d, J = 7.91 Hz, 1H), δ 7.12 - 7.26 (m, 5H), δ 7.66 (m, 2H), δ 7.85 (s, 1H), δ 7.99 (dd, J = 1.85, 7.80 Hz, 1H), δ 8.33 (dd, J = 1.97, 7.94 Hz, 1H);

tert-butyl 4-{1*S*-[1*S*-(5 phenylbenzooxazol-2-ylcarbonyl)-3 phenylpropylcarbamoyl]-3-methylbutylcarbamoyl}piperidine-1-carboxylate (Compound 282); MS (ESI) m/z = 681 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.85 - 0.98 (m, 6H), δ 1.43 (s, 9H), δ 1.60 - 1.85 (m, 5H), δ 2.14 - 2.30 (m, 2H), δ 2.56 (m, 1H), δ 2.75 (m, 4H), δ 4.12 (m, 2H), δ 4.52 (m, 1H), δ 5.69 (m, 1H), δ 5.92 (d, J = 6 Hz, 1H), δ 6.85 (d, J = 6 Hz, 1H), δ 7.13 - 7.26 (m, 7H), δ 7.36 - 7.80 (m, 7H), δ 8.05 (s, 1H), ($C_{40}H_{48}N_4O_6$);

N-{3-methyl-1*S*-[3-phenyl-1*S*-(naphtho[1,2-*d*]oxazol-2-ylcarbonyl)propylcarbamoyl]butyl}piperidine-4-carboxamide (Compound 283), ^{1}H NMR (DMSO-d_6): δ 0.81 (m, 6H), δ 1.35 - 1.86 (m, 7H), δ 1.96 - 2.11 (m, 1H), δ 2.26 - 2.53 (m, 2H), δ 2.64 - 2.91 (m, 4H), δ 3.26 (bd, J = 11.63 2H), δ 4.42 (m, 1H), δ 5.27 (m, 1H), δ 7.19 - 7.36 (m, 5H), δ 7.70 (t, J = 7.91 Hz, 1H), δ 7.83 (t, J = 7.43 Hz, 1H), δ 8.01 (d, J = 8.91 Hz, 1H), δ 8.08 (m, 1H), δ 8.18 (d, J = 8.91 Hz, 2H), δ 8.27 (bs, 1H), δ 8.39 (d, J = 7.91 Hz, 1H), δ 8.56 (bs, 1H), δ 8.75 (d, J = 6.45 Hz, 1H);

N-{(3-methyl-1*S*-[3-phenyl-1*S*-(naphtho[2,1-*d*]benzooxazol-2-ylcarbonyl)propylcarbamyl]butyl}piperidine-4-carboxamide (Compound 284),^{1}H NMR (DMSO-d_6): δ 0.81 (t, J = 6.43 Hz, 6H), δ 1.3 1.87 (m, 7H), δ 1.97 - 2.12 (m, 1H), δ 2.24 - 2.38 (m, 1H), δ 2.42 - 2.53 (m, 1H), δ 2.66 - 2.93 (m, 4H), δ 3.26 (bd, J = 10.12 2H), δ 4.41 (m, 1H), δ 5.26 (m, 1H), δ 7.16 - 7.34 (m, 5H), δ 7.77 (m, 2H), δ 7.97 (d, J = 8.91 Hz, 1H), δ 8.05 (d, J = 8.86 Hz, 1H), δ 8.07 (d, J = 8.64 Hz, 1H), δ 8.19 (d, J = 7.91 Hz, 1H), δ 8.26 (bs, 1H), δ 8.28 (d, J = 7.67 Hz, 1H), δ 8.56 (bs, 1H), δ 8.78 (d, J = 6.43 Hz, 1H);

N-{3-methyl-1-[3-phenyl-1-(5-phenylbenzooxazol-2-ylcarbonyl)propylcarbamoyl]butyl}piperidine-4-carboxamide (Compound 285);

benzyl 1-[1-(4-phenyethylcarbamoyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 286), MS (ESI)) m/z = 625 (M + 1); ^{1}H NMR ($CDCl_3$): δ 0.8 - 1.05 (d, J = 4 Hz, 6H), δ 1.50 (m, 1H), δ 1.65 (m, 3H), δ 2.00 - 2.20 (m, 1H), δ 2.35 (m, 1H), δ 2.60 (m, 2H), δ 2.99 (t, J = 4Hz, 2H), δ 3.67(q, J = 3 Hz, 2H), 4.19 (m, 1H), δ 5.17 (s, 2H), δ 5.59 (m, 1H), δ 6.85 - 6.98 (m, 2H), δ 7.10 - 7.47 (m, 15H), δ 8.43 (s, 1H); ($C_{36}H_{40}N_4O_6$);

benzyl 1-{1-[4-(3-phenylpronylcarbamoyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl} -3-methylbutylcarbamate (Compound 287); MS (ESI) m/z = 639 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.95 (d, J = 6 Hz, 6H), δ 1.50 (m, 1H), δ 1.65 (m, 3H), δ 2.00 (m, 4H), δ 2.35 (m, 1H), δ 2.67 (m, 4H), δ 3.49 (m, 2H), δ 4.20 (m, 1H), δ 5.09 (s,

2H), δ 5.50 (m, 1H), δ 6.85 (m, 1H), δ 7.23(m, 15H), δ 8.35 (s, 1H), δ ($C_{37}H_{42}N_4O_6$);
tert-butyl 4-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-methylbutylcarbamoyl]piperidine-1-carboxylate (Compound 288);
tert-butyl 3-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-methylbutylcarbamoyl]benzylcarbamate (Compound 289);
N-[2-methyl-1*S*-(3-phenyl-1*S*-benzooxazol-2-ylcarbonyipropylcarbamoyl)butyl]piperidine-4-carboxamide (Compound 290);
N-[2-methyl-1*S*-(3-phenyl-1*S*-benzooxazol-2-ylcarbonylpropylcarbamoyl)butyl]-3-aminomethylbenzamide (Compound 291);
benzyl 1-{1-[4-(2-indol-3-ylethylcarbamoyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 292); MS (ESI) m/z = 664 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.94 (d, J = 6 Hz, 6H), δ 1.40 - 1.70 (m, 6H), δ 2.00 (m, 1H), δ 2.25(m, 1H), δ 2.67 (m, 2H), δ 3.09 (m, 2H), δ 3.52 - 3.85 (m, 2H), δ 4.20 (m, 1H), δ 5.09 (s, 2H), δ 5.50 (m, 1H), δ 6.80 (d, J = 6 Hz, 1H), δ 6.99 - 7.41(m, 14H), δ 7.65 (d, J = 6 Hz, 1H), δ 8.35 (s, 1H), δ 8.39 (s, 1H), ($C_{38}H_{41}N_5O_6$);
benzyl 1-[1-(4-methylcarbamoyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 293); MS (ESI) m/z = 535 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.95 (d, J = 6 Hz, 6H), δ 1.33 - 1.70 (m, 5H), δ 2.00 (m, 1H), δ 2.28 (m, 1H), δ 2.67 (m, 2H), δ 2.99 (d, J = 2 Hz, 3H), δ 4.15 (m, 1H), δ 5.09 (m, 2H), δ 5.50 (m, 1H), δ 6.88 (m, 1H), δ 7.09 - 7.38 (m, 10H), δ 8.35 (s, 1H), ($C_{29}H_{34}N_4O_6$);
benzyl 2-{2-[2-(2-benzyloxycarbonylamino-4-methylvalerylamino)-4-phenylbutyryl]oxazol-2-ylcarbonylamino}valerate (Compound 294);
benzyl 1*S*-{1*S*-[4-(4-benzylpiperidin-1-ylcarbonyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 295); MS (ESI) m/z = 679 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.92 (m, 6H), δ 1.25 (m, 1H), δ 1.48 (q, J = 4 Hz, 1H), δ 1.52 - 1.85 (m, 6H), δ 2.09(m, 1H), δ 2.36 (m, 1H), δ 2.53 - 2.77 (m, 3H), δ 3.03 (t, J = 8 Hz, 4H), δ 4.19 (m, 1H), δ 4.65 (m, 1H), δ 5.02 - 5.13 (m, 3H), δ 5.53 (m, 1H), δ 6.68 (d, J = 6 Hz, 1H), δ 7.08 - 7.39 (m, 15H), δ 8.28 (s, 1H), ($C_{40}H_{46}N_4O_6$);
benzyl 1*S*-[1*S*-(4-fur-2-ylmethylcarbamoyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 296); MS (ESI) m/z = 601 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.98 (d, J = 6 Hz 6H), δ 1.58 (q, J = 6 Hz 1H), 1.62 (m, 4H), δ 2.00 (m, 1H), δ 2.27 (m, 1H), δ 2.76 (m, 2H), δ 4.20 (m, 1H), δ 4.70 (d, J = 4 Hz, 2H), δ 4.98 - 5.18 (m, 2H), δ 5.56 (m, 1H), δ 6.82 (m, 1H), δ 7.05 - 7.42 (m, 13H), δ 8.32 (d, J = 4 Hz, 1H), ($C_{33}H_{36}N_4O_7$);
benzyl 3-methyl-1*S*-[1*S*-(4-pyrid-2-ylmethylcarbamoyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]butylcarbamate (Compound 297); MS (ESI) m/z = 612 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.98 (d, J = 6 Hz 6H), δ 1.4 - 2.15 (m, 5H), δ 2.32 (m, 1H), δ 2.71 (m, 2H), δ 4.21 (m, 1H), δ 4.75 (d, J = 2 Hz, 2H), δ 5.09 (m, 2H), δ 5.15 - 5.5 (m, 1H), δ 7.10 - 7.38 (m, 13H), δ 7.7 (t, J = 4 Hz, 1H), δ 7.95 (m, 1H), δ 8.32 (d, J = 4 Hz, 1H), δ 8.59 (s, 1H), ($C_{34}H_{37}N_5C_6$);
benzyl 3-methyl-1*S*-[1*S*-(4-pyrid-3-ylmethylcarbamoyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]butylcarbamate (Compound 298); MS (ESI) m/z = 612 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$); δ 0.98 (d, J = 6 Hz 6H), δ 1.5 (q, J= 4 Hz, 1H), δ 1.65 (m, 2H), δ 1.95 (m, 3H), 2.25 δ (m, 1H), δ 2.68 (m, 2H), δ 4.19 (m, 1H), δ 4.72 (d, J = 2 Hz, 2H), δ 5.09 (s, 2H), δ 5.41 (m, 1H), δ 6.90 (t, J= 2 Hz, 1H), δ 7.05 - 7.35 (m, 10H), δ 7.46 (m, 1H), δ 7.72 (d, J= 6 Hz, 1H), δ 8.31 (d, J = 4 Hz, 1H), δ 8.62 (d, J = 4 Hz 1H), δ 8.73 (s, 1H), ($C_{34}H_{37}N_5O_6$);
benzyl 3-methyl-1*S*-[1*S*-(4-pyrid-4-ylmethylcarbamoyloxazol-2-ylcarbonyl)-3-phenypropylcarbamoyl]butylcarbamate (Compound 299); MS (ESI) m/z = 612 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.98 (d, J = 6 Hz, 6H), δ 1.5 (q, J = 4 Hz, 1H), 1.65 (m, 2H), 1.95 (m, 3H), 2.25 (m, 1H), 2.68 (m, 2H), 4.19 (m, 1H), 4.72 (t, J = 2 Hz, 2H), 5.11 (d, J= 4 Hz, 2H), 5.43 (m, 1H), 6.92 (d, J= 6 Hz, 1H), 7.05 - 7.35 (m, 11H), 7.46 (m, 1H), 8.33 (d, J = 4 Hz, 1H), 8.58 (m, 2H), ($C_{34}H_{37}N_5O_6$);
benzyl 1*S*-{1*S*-[4-(2-chlorobenzylcarbamoyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 300); MS (ESI) m/z = 646 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.98 (d, J = 6 Hz, 6H), δ 1.5 (q, J = 4 Hz, 1H), δ 1.62 (m, 4H), 1.95 δ (m, 1H), δ 2.30 (m, 1H), δ 2.65 (m, 2H), δ 4.19 (m, 1H), δ 4.70 (d, J = 2 Hz, 2H), δ 5.09 (m, 2H), δ 5.47 (m, 1H), δ 6.82 (m, 1H) δ 7.05 - 7.45 (m, 14H), δ 8.33 (d, J = 4 Hz, 1H), ($C_{35}H_{37}ClN_4O_6$);
benzyl 1*S*-{1*S*-[4-(3-chlorobenzylcarbamoyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 301); MS (ESI) m/z = 646 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.98 (d, J = 6 Hz, 6H), δ 1.5 (q, J = 4 Hz, 1H), δ 1.62 (m, 4H), δ 2.00 (m, 1H), δ 2.25 (m, 1H), δ 2.65 (m, 2H), δ 4.20 (m, 1H), δ 4.68 (d, J = 2 Hz, 2H), δ 5.09 (m, 2H), δ 5.43 (m, 1H), δ 6.85 (d, J = 6 Hz, 1H), δ 7.05 - 7.45 (m, 14H), δ 8.33 (d, J = 4 Hz, 1H), ($C_{35}H_{37}ClN_4O_6$);
benzyl 1*S*-{1*S*-[4-(4-chlorobenzylcarbamoyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 302); MS (ESI) m/z = 646 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.98 (d, J = 6 Hz, 6H), δ 1.5 (q, J = 4 Hz, 1H), δ 1.62 (m, 4H), δ 2.00 (m, 1H), δ 2.25 (m, 1H), δ 2.65 (m, 2H), δ 4.20 (m, 1H), δ 4.68 (d, J = 2

Hz, 2H), δ 5.09 (m, 2H), δ 5.43 (m, 1H), δ 6.85 (m, 1H), δ 7.05 - 7.45 (m, 14H), δ 8.33 (d, J = 4 Hz, 1H), ($C_{35}H_{37}ClN_4O_6$);

benzyl 3-methyl-1*S*-{1*S*-[4-(2*S*-phenylcycloprop-1*S*-ylcarbamoyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 303); MS (ESI) m/z = 637 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.92 (d, J = 6 Hz, 6H), δ 1.46 - 1.78 (m, 6H), δ 2.00 (m, 3H), δ 2.31 (m, 1H), δ 2.67 (m, 2H), δ 2.99 - 3.22 (m, 1H), δ 4.20 (m, 1H), δ 5.04 (d, J = 6 Hz, 1H), δ 5.11 (s, 2H), δ 5.54 (m, 1H), δ 6.87 (m, 1H), δ 7.08 - 7.47 (m, 15H), δ 8.30 (d, J = 2 Hz, 1H), ($C_{37}H_{40}N_4O_6$);

benzyl 3-methyl-1*S*-[1*S*-(4-diphenylmethylmethylcarbamoyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 304); MS (ESI) m/z = 687 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.98 (d, J = 6 Hz, 6H), δ 1.48 (q, J = 4 Hz, 1H), δ 1.62 (m, 2H), δ 2.00 (m, 1H), δ 2.30 (m, 1H), δ 2.67 (m, 2H), δ 4.18 (m, 1H), δ 5.09 (m, 3H), δ 5.43 (m, 1H), δ 6.42 (d, J = 6 Hz, 1H), δ 6.80 (d, J = 6Hz, 1H), δ 7.02 - 7.72 (m, 20H), δ 7.79 (d, J = 6 Hz, 1H); δ 8.33 (d, J = 4 Hz, 1H), ($C_{41}H_{42}N_4O_6$);

benzyl 1*S*-[1*S*-(4-adamantan-1-ylmethylcarbamoyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 305); MS (ESI) m/z = 670 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.92 (m, 8H), δ 1.18 - 1.78 (m, 16H), δ 2.00 (m, 1H), δ 2.31 (m, 1H), δ 2.67 (m, 2H), δ 2.99 - 3.09 (m, 2H), δ 4.21 (m, 1H), δ 5.11 (m, 3H), δ 5.51 (m, 1H), δ 6.87 (m, 1H), δ 7.02 (m, 1H), δ 7.08 - 7.47 (m, 10H), δ 8.31 (d, J = 2 Hz, 1H), ($C_{39}H_{48}N_4O_6$);

benzyl 1-{1-[4-(1-methylethylcarbamoyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 306);

benzyl 1-{1-[4-(1*S*-phenylethylcarbamoyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 307); MS (ESI) m/z = 625 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.92 (d, J = 6 Hz, 6H), δ 1.54 - 1.65 (m, 7H), δ 2.00 (m, 1H), δ 2.25 (m, 1H), δ 2.65 (m, 2H), δ 4.15 (m, 1H), δ 4.99 (d, J = 2 Hz, 1H), δ 5.09 (s, 2H), δ 5.32 (m, 1H], δ 5.43 (m, 1H), δ 6.79 (d, J = 6 Hz, 1H), δ 7.05 - 7.45 (m, 15H), δ 8.31 (s, 1H), ($C_{36}H_{40}N_4O_6$);

benzyl 1-{1-[4-(1*R*-phenylethylcarbamoyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 308); MS (ESI) m/z = 625 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.92 (d, J = 6 Hz, 6H), δ 1.45 - 1.68 (m, 7H), δ 2.00 (m, 1H), δ 2.25 (m, 1H), δ 2.65 (m, 2H), δ 4.15 (m, 1H), δ 4.99 (d, J = 2 Hz, 1H), δ 5.09 (s, 2H), δ 5.32 (m, 1H), δ 5.43 (m, 1H), δ 6.79 (d, J = 6 Hz, δ 1H), δ 7.05 - 7.45 (m, 15H), δ 8.31 (s, 1H), ($C_{36}H_{40}N_4O_6$);

benzyl 1-{1-[4-(*N*-benzyl-*N*-methylcarbamoyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 309); MS (ESI) m/z = 625 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.90 (d, J = 6 Hz, 6H), δ 1.27 - 1.68 (m, 4H), δ 2.00 (m, 1H), δ 2.25 (m, 1H), δ 2.65 (m, 2H), δ 3.10 (s, 1H), δ 4.19 (m, 1H), δ 4.71 (s, 2H), δ 5.09 (s, 2H), δ 5.22 (m, 1H), δ 5.43 (m, 1H), δ 6.99 (d, J = 6 Hz, 1H), δ 7.05 - 7.45 (m, 15H), δ 7.60 (m, 1H), δ 8.31 (s, 1H), ($C_{36}H_{40}N_4O_6$).

benzyl 1-[1-(4-pyrrolidin-1-ylcarbonyloxazol-2-ylcarbonly)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 310); MS (ESI) m/z = 575 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.93 (d, J = 6 Hz, 6H), δ 1.45 - 1.73 (m, 3H), δ 1.85 - 2.12 (m, 5H), δ 2.34 (m, 1H), δ 2.64 (m, 2H), δ 3.62 (t, J = 4 Hz, 2H), δ 3.82 (m, 2H), δ 4.21 (m;. 1H, 4.99 - 5.11 (m, 2H), δ 5.55 (m, 1H), δ 5.43 (m, 1H), δ 6.79 (m, 1H), δ 7.05 - 7.45 (m, 10H),δ 8.31 (d, J = 2Hz, 1H), ($C_{32}H_{38}N_4O_6$)·

benzyl 1-[1-(4-piperidin-1-ylcarbonyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 311); MS (ESI) m/z = 589 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.90 (d, J = 6 Hz, 6H), δ 1.25 (m, 2H), δ 1.49 - 1.66 (m, 6H), δ 2.12 (m, 1H), δ 2.34 (m, 1H), δ 2.64 (m, 2H), δ 3.65 (m, 2H), δ 3.85 (m, 2H), δ 4.17 (m, 1H), δ 4.99 - 5.11 (m, 3H), δ 5.55 (m, 1H), δ 6.67 (m, 1H), δ 7.08 - 7.39 (m, 11H), δ 8.27 (s, 1H), ($C_{33}H_{40}N_4O_6$);

benzyl 1-{1-[4-(2,3-dihydroindol-1-ylcarbonyl)oxazol-2-ylcarbonyl]-3-phenlypropylcarbamoyl}-3-methylbutylcarbamate (Compound 312);

benzyl 1-{1-[4-(3,4-dihydro-1*H*-isoquinol-2-ylcarbonyl)oxazol-2-ylcarbonyl]-3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 313); MS (ESI) m/z = 637 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.90 (d, J = 6 Hz, 6H), δ 1.25 (m, 2H), δ 1.45 - 1.79 (m, 4H), δ 2.11 (m, 1H), δ 2.40 (m, 1H), δ 2.68 (m, 2H), δ 2.95. (t, J = 4 Hz, 2H), δ 3.96 (t, J = 4 Hz, 1H), δ 4.15 (m, 2H), δ 4.86 (d, J = 6 Hz, 1H), δ 4.99 - 5.11 (m, 3H), δ 5.59 (m, 1H), δ 6.70 (m, 1H), δ 7.05 - 7.45 (m, 12H), δ 8.35 (s, 1H), ($C_{37}H_{40}N_4O_6$);

benzyl 1-{1-[4-(3,4-dihydro-2*H*-quinol-1-ylcarbonyl)oxazol-2-ylcarbonyl] 3-phenylpropylcarbamoyl}-3-methylbutylcarbamate (Compound 314); MS (ESI) m/z = 637 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.90 (d, J = 6 Hz, 6H), δ 1.25 (m, 2H), δ 1.40 - 1.69 (m, 3H), δ 2.05 (m, 2H), δ 2.52 (t, J = 6 Hz, 2H), δ 2.82 (t, J = 4 Hz, 2H), δ 3.80 - 4.21 (m, 4H), δ 4.86 (d, J = 6 Hz, 1H), δ 5.09 (s, 2H), δ 5.21 (m, 1H), δ 6.62 (m, 1H), δ 6.85 - 7.31 (m, 11H), δ 7.51 (m, 1H), δ 7.67 (m, 1H), δ 8.31 (s, 1H), ($C_{37}H_{40}N_4O_6$);

benzyl 1-[1-(4-naphth-1-ylmethylcarbamoyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]-3-methylbutylcarbamate (Compound 315); MS (ESI) m/z = 661 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.90 (d, J = 6 Hz, 6H), δ 1.25 (m, 2H), δ 1.54 (m, 3H), δ 2.05 (m, 1H), δ 2.59 (t, J = 6 Hz, 1H), δ 2.82 (t, J = 4 Hz, 2H), δ 4.12 (m, 1H), δ 4.90 - 5.09 (m, 4H), δ 5.34 (m, 1H), δ 6.71 (m, 1H), δ 6.95 - 7.12 (m, 3H), δ 7.27 (m, 10H), δ 7.51(m, 2H), δ 7.88 (t, J = 6 Hz, 1H), δ 8.06 (d, J = 6 Hz, 1H), δ 8.35 (s, 1H), ($C_{39}H_{40}N_4O_6$);

tert-butyl 4-[1*S*-(1*S*-benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl)-2-cyclohexylethylcarbamoyl]piperid-

ine-1-carboxylate (Compound 316);
1*S*-{1*S*-[4-(3,4-dihydro-2*H*-quinol-1-ylcarbonyl)oxazol-2-ylcarbonyl]-ethylcarbamoyl}-3-methylbutylcarbamate (Compound 317);
benzyl 3-methyl-1*S*-[1*S*-(5-phenyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]butylcarbamate (Compound 318); MS (ESI) m/z = 554 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.97 (d, J = 4 Hz, 6H), δ 1.50 (t, J = 4 Hz, 1H), δ 1.65 - 1.82 (m, 3H), δ 2.20 (m, 1H), δ 2.48 (m, 1H), δ 2.75 (t, J = 4 Hz, 2H), δ 4.27 (m, 1H), δ 5.09 (s, 2H), δ 5.65 (m, 1H), δ 6.85 (d, J = 6Hz, 1H), δ 7.12 - 7.62 (m, 14H), δ 7. 77 (d, J = 2 Hz, 2H), ($C_{33}H_{35}N_3O_5$);
pyrid-3-yl 3-methyl-1*S*-[1*S*-(5-phenyloxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl]butylcarbamate (Compound 319); MS (ESI) m/z = 525 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.80 - 1.05 (m, 6H), δ 1.27 (m, 3H), δ 1.72 (m, 3H), δ 2.15 (m, 1H), δ 2.46 (m, 1H), δ 2.77 (t, J = 4 Hz, 2H), δ 4.75 (m, 1H), δ 5.65 (m, 1H), δ 6.95 (d, J = 4Hz, 1H), δ 7.02 (d, J = 4Hz, 1H), δ 7.09 - 7.35 (m, 5H), δ 7.37 - 7.62 (m, 3H), δ 7.80 (d, J = 4 Hz, 1H), δ 8.15 (d, J = 6Hz, 1H), δ 8.75 (m, 1H), δ 9.09 (s, 1H), ($C_{31}H_{32}N_4O_4$);
benzyl 1*S*-[1*S*-(5-phenyloxazol-2-ylcarbonyl)-3-phenylpropylsulfamoylmethyl]-2*R*-methylbutylcarbamate (Compound 320); MS (ESI) m/z = 604 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.95 (m, 6H), δ 1.25 (m, 1H), δ 1.49 (m, 1H), δ 1.65 (m, 1H), δ 2.15 (m, 1H), δ 2.48 (m; 1H), δ 2.85 (m, 2H), δ 3.12 (m, 2H), δ 4.46 (m, 1H), δ 4.99 (d, J = 8Hz, 1H), δ 5.12 (m, 3H), δ 6.32 (d, J = 6Hz, 1H), δ 7.19 - 7.55 (m, 14H), δ 7.76 (m, 2H), ($C_{33}H_{37}N_3O_6S$);
benzyl 3-methyl-1-{2-hydroxy-1-phenethyl-2-[4-(3-phenylpropylcarbamoyl)oxazol-2-yl]ethylcarbamoyl}butylcarbamate (Compound 321);
benzyl 1-{2-hydroxy-2-[4-(2-indol-3-ylethylcarbamoyl)oxazol-2-yl]-1-phenethylethylcarbamoyl}-3-methylbutylcarbamate (Compound 322); MS (ESI) m/z = 666 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.90 (d, J = 6 Hz, 6H), δ 1.40 - 1.80 (m, 6H), δ 2.00 (m, 1H), δ 2.67 (m, 2H), δ 3.09 (m, 2H), δ 3.52 - 3.85 (m, 2H), δ 3.99 - 4.20 (m, 2H), δ 4.26 - 4.44 (m, 1H), δ 4.81 (s, 1H), δ 5.09 (s, 2H), δ 5.50 (m, 1H), δ 6.72 (d, J = 6 Hz, 1H), δ 6.99 - 7.41 (m, 14H), δ 8.18 (s, 1H), δ 8.39 (s, 1H), ($C_{38}H_{43}N_5O_6$);
benzyl 3-methyl-1-[2-hydroxy-2-(4-methylcarbamoyloxazol-2-yl)-1-phenethylethylcarbamoyl]butylcarbamate (Compound 323); MS (ESI) m/z = 537 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.90 (d, J = 6 Hz, 6H), δ 1.33 - 1.80 (m, 6H), δ 2.00 (m, 1H), δ 2.67 (m, 2H), 2.89 (m, 3H), δ 4.10 (m, 1H), δ 4.25 (m, 1H), δ 4.81 (s, 1H), δ 5.09 (m, 3H), δ 6.68 (d, J = 4 Hz, 1H), δ 7.09 - 7.38 (m, 10H), δ 8.18 (s, 1H), ($C_{29}H_{36}N_4O_6$);
benzyl 2-{2-[2-(2-benzyloxycarbonylamino-4-methylvalerylamino)-1-hydroxy-4-phenylbutyl]oxazol-2-ylcarbonylamino}valerate (Compound 324); MS (ESI) m/z = 727 (M + 1); ^{1}H-NMR (300 MHz, $CDCl_3$): δ 0.95 (m, 12H), δ 1.45 - 1.80 (m, 9H), δ 2.00 (m, 1H), δ 2.67 (m, 2H), δ 3.99 - 4.15 (m, 2H), δ 4.85 (m, 2H), δ 5.09 (m, 4H), δ 5.50 (m, 1H), δ 6.88 (m, 1H), δ 7.12 - 7.45 (m, 15H), δ 8.18 (s, 1H), ($C_{41}H_{50}N_4O_8$);
benzyl 1*S*-{2-[4-(4-benzylpiperidin-1-ylcarbonyl)oxazol-2-yl]-2-hydroxy-1*S*-phenethylethylcarbamoyl}-3-methylbutylcarbamate (Compound 325);
benzyl 1*S*-[2-(4-fur-2-ylmethylcarbamoyloxazol-2-yl)-2-hydroxy-1*S*-phenethylethylcarbamoyl]-3-methylbutylcarbamate (Compound 326);
benzyl 3-methyl-1*S*-[2-hydroxy-1*S*-phenethyl-2-(4-pyrid-2-ylmethylcarbamoyloxazol-2-yl)ethylcarbamoyl]butylcarbamate (Compound 327);
benzyl 3-methyl-1*S*-[2-hydroxy-1*S*-phenethyl-2-(4-pyrid-3-ylmethylcarbamoyloxazol-2-yl)ethylcarbamoyl]butylcarbamate (Compound 328);
benzyl 3-methyl-1*S*-[2-hydroxy-1*S*-phenethyl-2-(4-pyrid-4-ylmethylcarbamoyloxazol-2-yl)ethylcarbamoyl]butylcarbamate (Compound 329);
benzyl 3-methyl-1*S*-{2-[4-(2-chlorobenzylcarbamoyl)oxazol-2-yl]-2-hydroxy-1*S*-phenethylethylcarbamoyl}butylcarbamate (Compound 330);
benzyl 3-methyl-1*S*-{2-[4-(3-chlorobenzylcarbamoyl)oxazol-2-yl]-2-hydroxy 1*S*-phenethylethylcarbamoyl}butylcarbamate (Compound 331);
benzyl 3-methyl-1*S*-{2-[4-(4-chlorobenzylcarbamoyl)oxazol-2-yl]-2-hydroxy-1*S*-phenethylethylcarbamoyl}butylcarbamate (Compound 332);
benzyl 3-methyl-1*S*-{2-hydroxy-1*S*-phenethyl-2-[4-(2*R*-phenylcycloprop-1*S*-ylcarbamoyl)oxazol-2-yl]ethylcarbamoyl)butylcarbamate (Compound 333);
benzyl 1*S*-[2-(4-adamantan-1-ylmethylcarbamoyloxazol-2-yl)-2-hydroxy-methyl)-1*S*-phenethylethylcarbamoyl]-3-methylbutylcarbamate (Compound 334);
benzyl 3-methyl-1*S*-[2-hydroxy-1*S*-phenethyl-2-(4-diphenylmethylcarbamoyloxazol-2-yl)ethylcarbamoyl]butylcarbamate (Compound 335);
benzyl 3-methyl-1-{2-hydroxy-2-[4-(1-methylethylcarbamoyl)oxazol-2-yl]-1-phenethylethylcarbamoyl}butylcarbamate (Compound 336);
benzyl 3-methyl-1-{2-hydroxy-1-phenethyl-2-[4-(1*S*-phenylethylcarbamoyl)oxazol-2-yl]ethylcarbamoyl}butylcarbamate (Compound 337);
benzyl 3-methyl-1-{2-hydroxy-1-phenethyl-2-[4-(1*R*-phenylethylcarbamoyl)oxazol-2-yl]ethylcarbamoyl}butylcar-

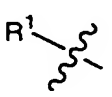
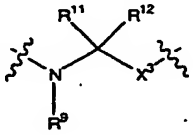
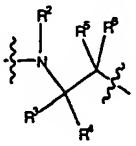
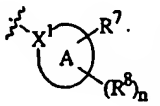
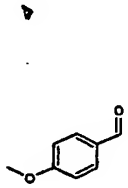
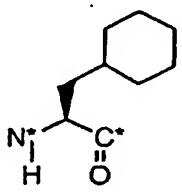
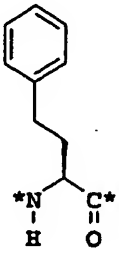
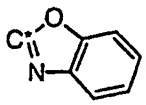
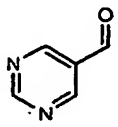
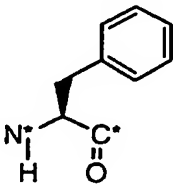
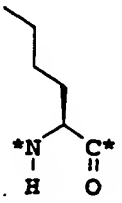
bamate (Compound 338);
benzyl 3-methyl-1-{2-[4-(*N*-benzyl-*N*-methylcarbamoyl)oxazol-2-yl]-2-hydroxy-1-phenethylethylcarbamoyl}butylcarbamate (Compound 339);
benzyl 3-methyl-1-[2-hydroxy-1-phenethyl-2-(4-pyrrolidin-1-ylcarbonyloxazol-2-yl)ethylcarbamoyl]butylcarbamate (Compound 340);
benzyl 3-methyl-1-[2-hydroxy-1-phenethyl-2-(4-piperidin-1-ylcarbonyloxazol-2-yl)ethylcarbamoyl]butylcarbamate (Compound 341);
benzyl 3-methyl-1-{2-[4-(2,3-dihydroindol-1-ylcarbonyl)oxazol-2-yl]-2-hydroxy-1-phenethylethylcarbamoyl}butylcarbamate (Compound 342);
benzyl 3-methyl-1-{2-[4-(3,4-dihydro-1*H*-isoquinol-2-ylcarbonyl)oxazol-2-yl]-2-hydroxy-1-phenethylethylcarbamoyl}butylcarbamate (Compound 343);
benzyl 3-methyl-1-{2-[4-(3,4-dihydro-1*H*-quinol-1-ylcarbonyl)oxazol-2-yl]-2-hydroxy-1-phenethylethylcarbamoyl}butylcarbamate (Compound 344);
benzyl 3-methyl-1-[2-hydroxy-2-(4-naphth-1-ylmethylcarbonyloxazol-2-yl)-1-phenethylethylcarbamoyl]butylcarbamate (Compound 345); and
benzyl 1*S*-{2-[4-(3,4-dihydro-2*H*-quinol-1-ylcarbonyl)oxazol-2-yl]-2-hydroxy-1*S*-methylethylcarbamoyl}-3-methylbutylcarbamate (Compound 346).

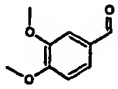
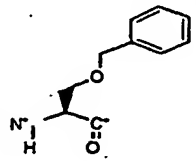
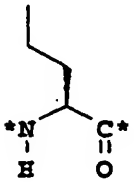
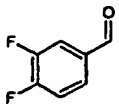
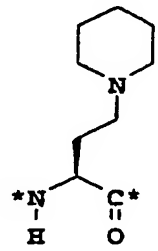
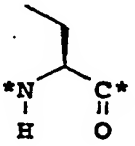
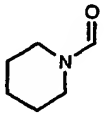
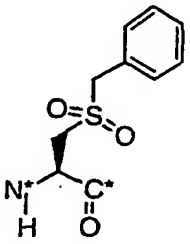
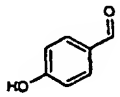
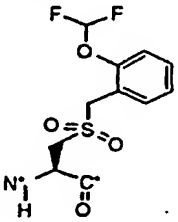
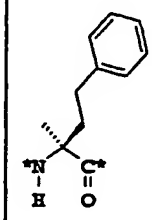
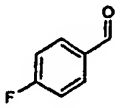
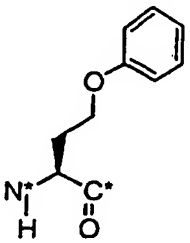
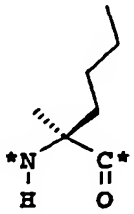
[0252] Proceeding by methods analogous to those described above provided the following compounds of Formula I:

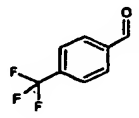
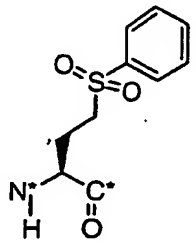
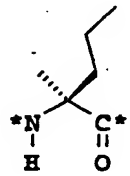
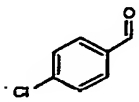
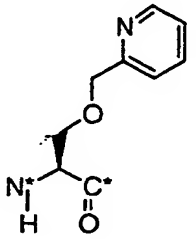
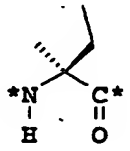
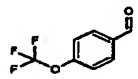
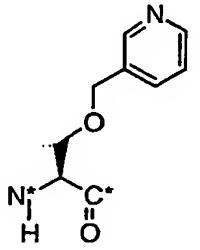
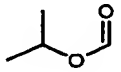
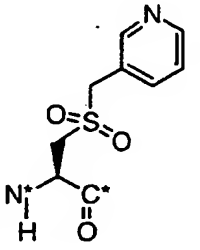
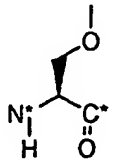
N-[3-methyl-1*S*-(1*S*-thiazol-2-ylcarbonylethylcarbamoyl)butyl]-4-morpholin-4-ylbenzamide (Compound 347); and
N-[1*S*-(2-benzooxazol-2-yl-1,1-dimethyl-2-oxoethylcarbamoyl)-3-methylbutyl]-4-(4-methylpiperazin-1-yl)benzamide (Compound 348).

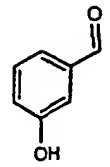
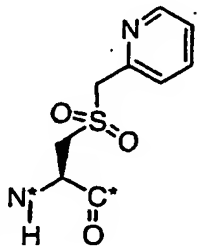
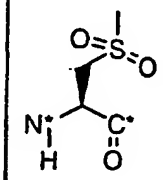
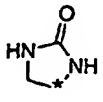
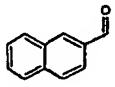
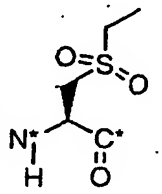
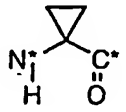
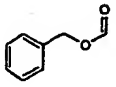
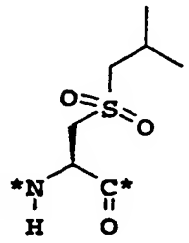
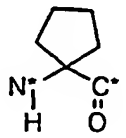
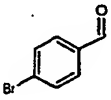
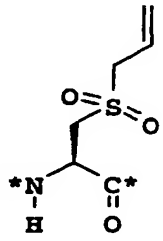
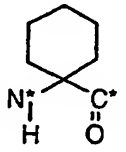
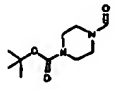
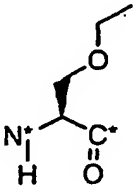
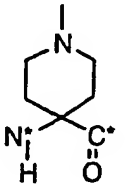
[0253] Proceeding by methods analogous to those set forth in this Application compounds of Formula I are provided which are comprised by the elements A, B, C and D listed in the following Table 1.

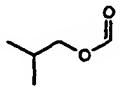
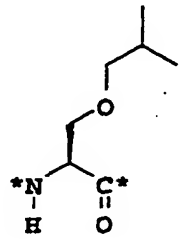
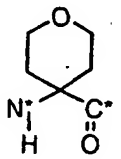
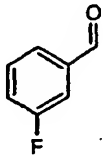
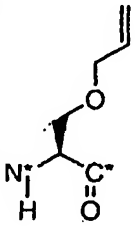
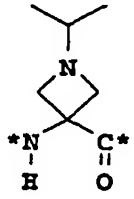
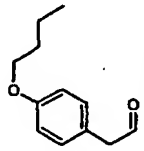
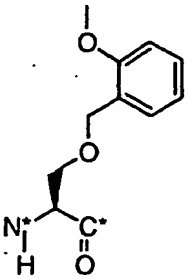
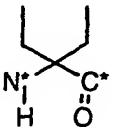
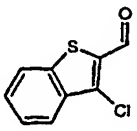
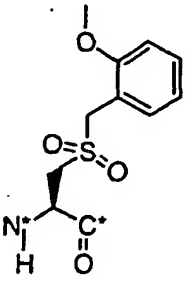
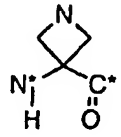
TABLE 1

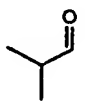
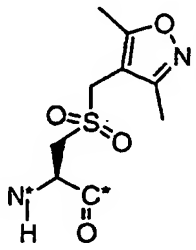
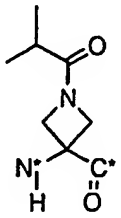
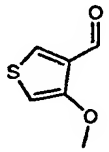
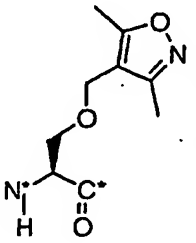
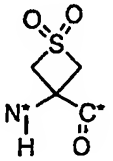
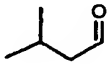
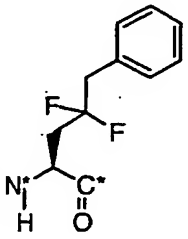
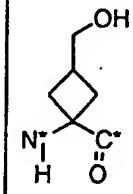
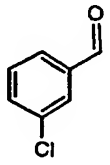
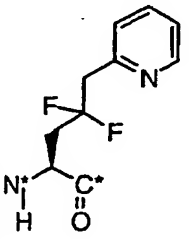
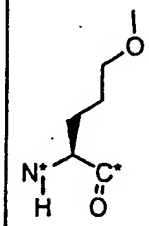
A		B		C		D	
A1		B1		C1		D1	
A2		B2		C2		D2	

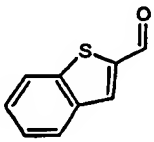
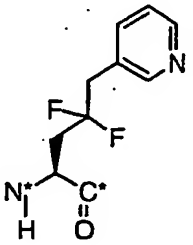
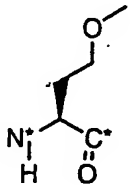
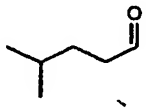
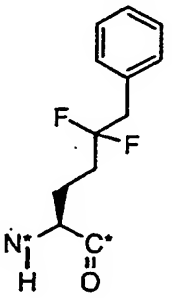
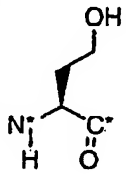
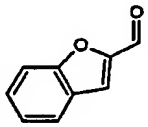
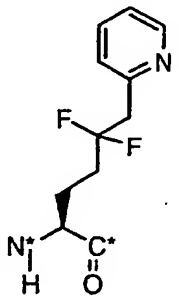
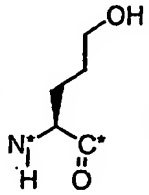
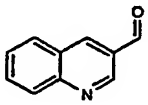
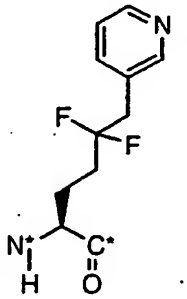
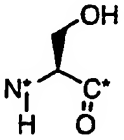
A3		B3		C3		D3	
A4		B4		C4		D4	
A5		B5		C5		D5	
A6		B6		C6		D6	
A7		B7		C7		D7	

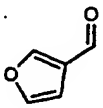
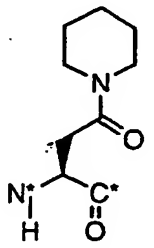
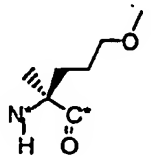
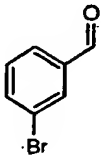
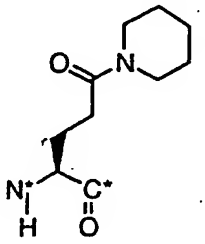
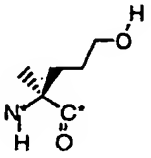
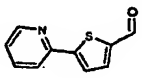
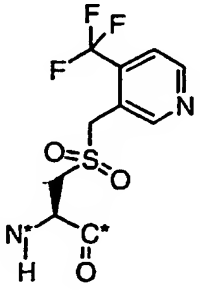
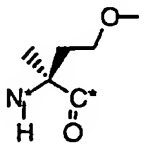
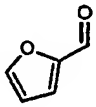
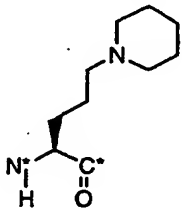
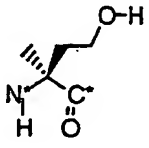
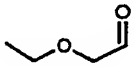
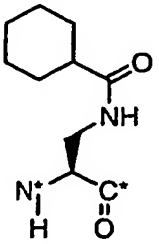
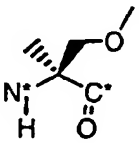
A8		B8		C8		D8	
A9		B9		C9		D9	
A10		B10		C10		D10	
A11		B11		C11		D11	

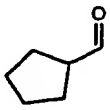
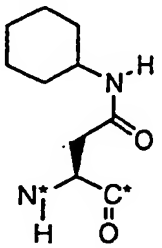
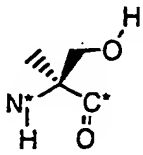
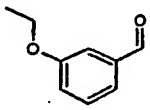
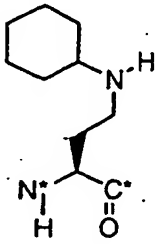
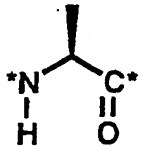
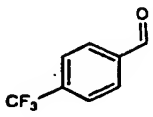
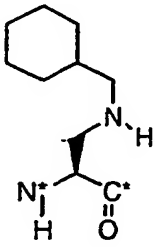
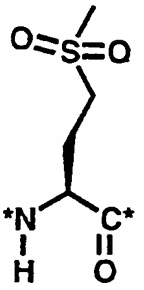
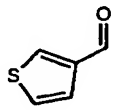
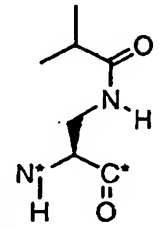
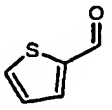
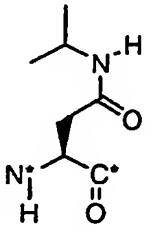
A12		B12		C12		D12	
A13		B13		C13		D13	
A14		B14		C14		D14	
A15		B15		C15		D15	
A16		B16		C16		D16	

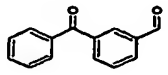
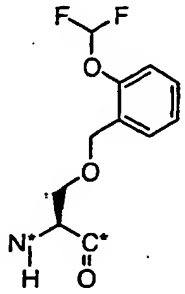
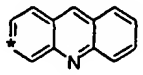
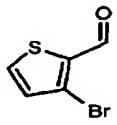
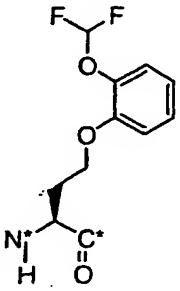
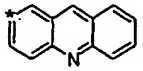
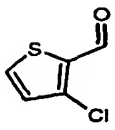
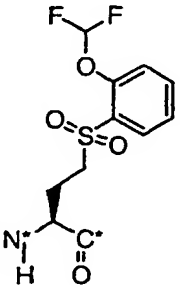
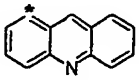
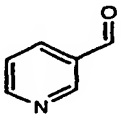
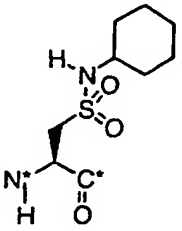
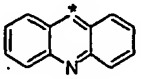
A17		B17		C17		D17	
A18		B18		C18		D18	
A19		B19		C19		D19	
A20		B20		C20		D20	

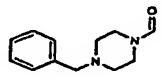
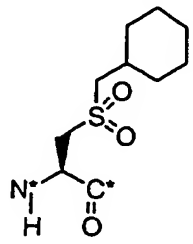
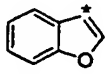
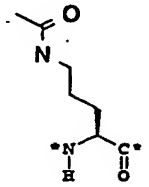
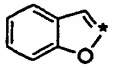
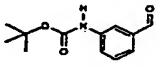
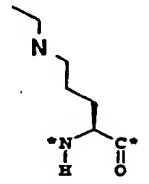
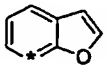
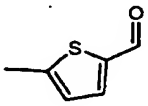
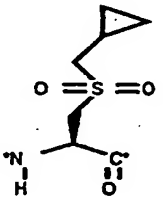
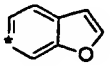
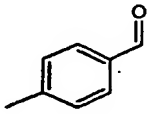
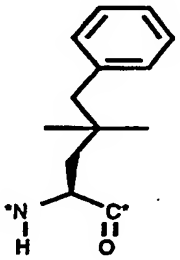
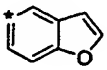
A21		B21		C21		D21	
A22		B22		C22		D22	
A23		B23		C23		D23	
A24		B24		C24		D24	

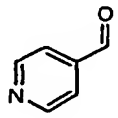
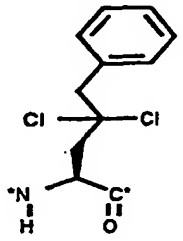
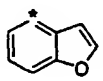
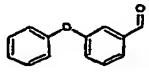
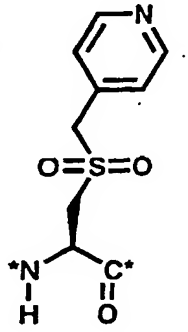
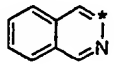
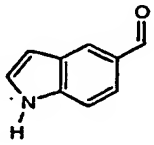
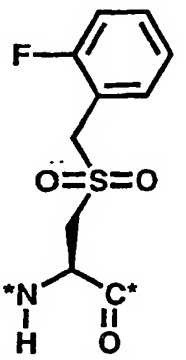
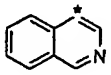
A25		B25		C25		D25	
A26		B26		C26		D26	
A27		B27		C27		D27	
A28		B28		C28		D28	

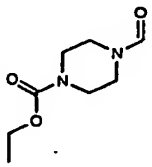
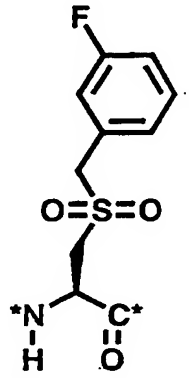
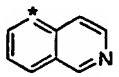
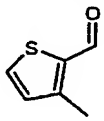
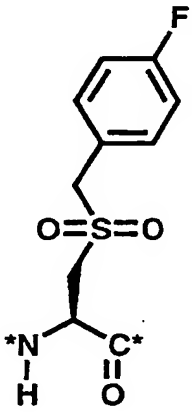
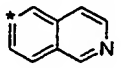
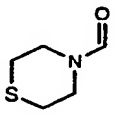
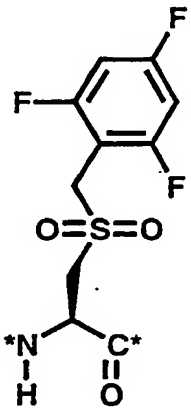
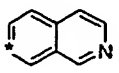
A29		B29		C29		D29	
A30		B30		C30		D30	
A31		B31		C31		D31	
A32		B32		C32		D32	
A33		B33		C33		D33	

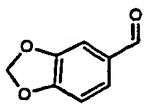
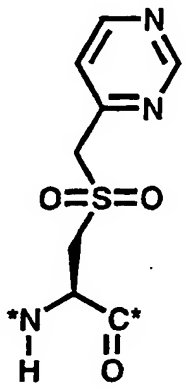
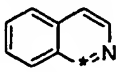
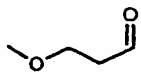
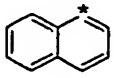
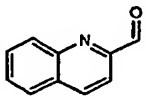
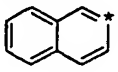
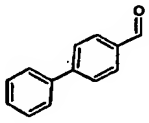
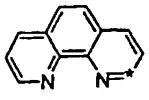
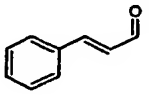
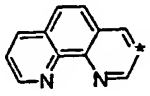
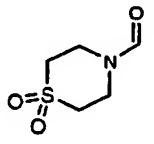
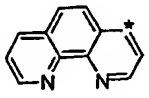
A34		B34		C34		D34	
A35		B35		C35		D35	
A36		B36		C36		D36	
A37		B37				D37	
A38		B38				D38	

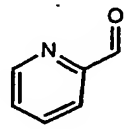
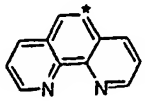
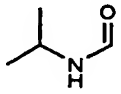
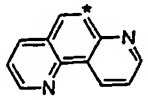
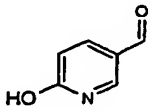
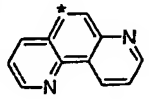
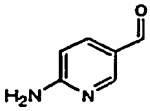
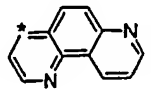
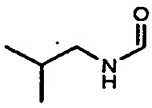
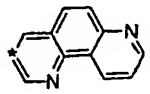
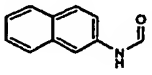
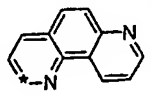
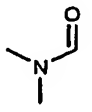
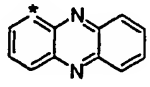
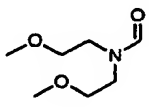
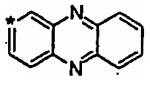
A39		B39				D39	
A40		B40				D40	
A41		B41				D41	
A42		B42				D42	

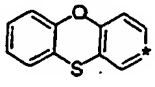
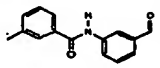
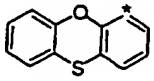
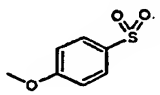
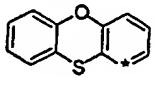
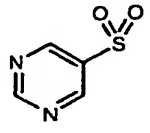
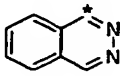
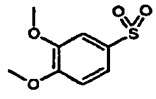
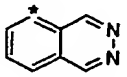
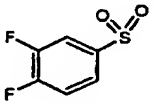
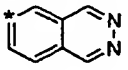
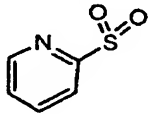
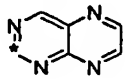
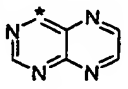
A43		B43				D43	
A44		B44				D44	
A45		B45				D45	
A46		B46				D46	
A47		B47				D47	

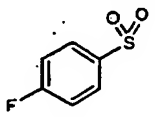
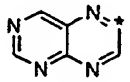
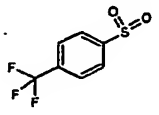
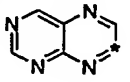
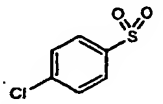
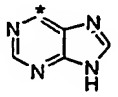
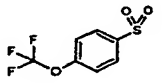
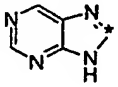
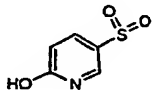
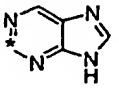
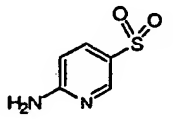
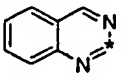
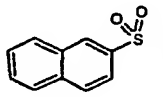
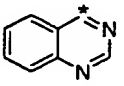
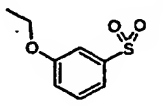
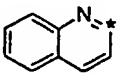
A48		B48				D48	
A49		B49				D49	
A50		B50				D50	

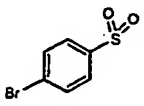
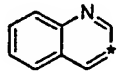
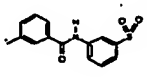
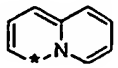
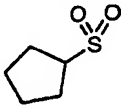
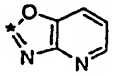
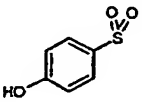
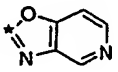
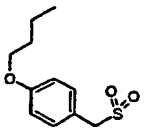
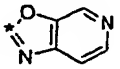
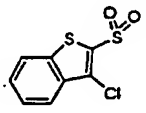
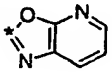
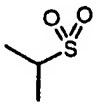
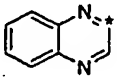
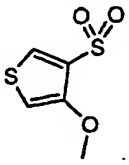
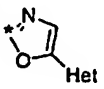
A51		B51				D51	
A52		B52				D52	
A53		B53				D53	

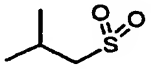
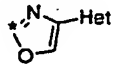
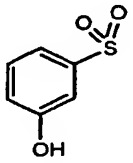
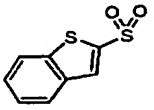
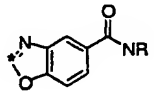
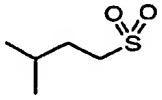
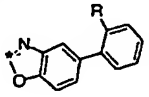
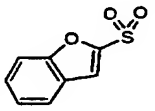
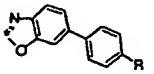
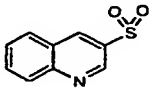
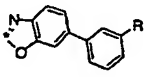
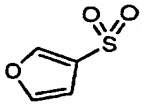
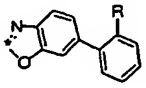
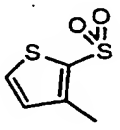
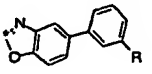
A54		B54				D54	
A55						D55	
A56						D56	
A57						D57	
A58						D58	
A59						D59	

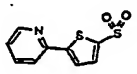
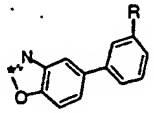
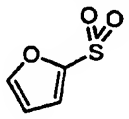
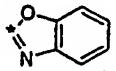
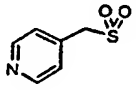
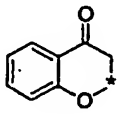
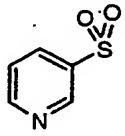
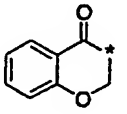
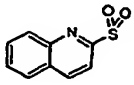
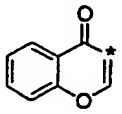
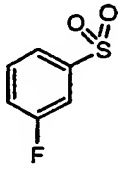
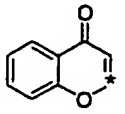
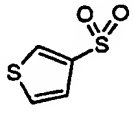
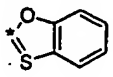
A60						D60	
A61						D61	
A62						D62	
A63						D63	
A64						D64	
A65						D65	
A66						D66	
A67						D67	

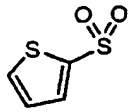
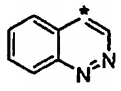
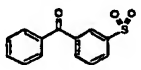
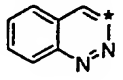
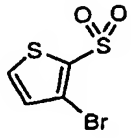
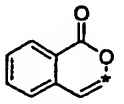
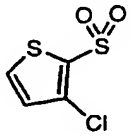
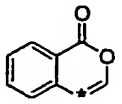
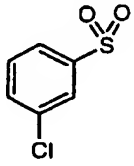
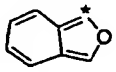
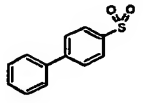
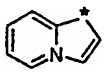
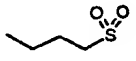
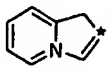
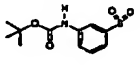
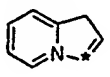
A68						D68	
A69						D69	
A70						D70	
A71						D71	
A72						D72	
A73						D73	
A74						D74	
A75						D75	

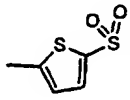
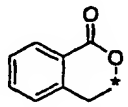
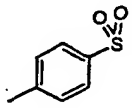
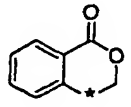
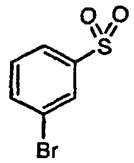
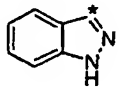
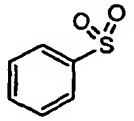
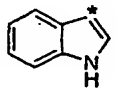
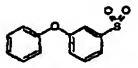
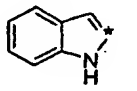
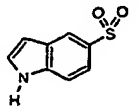
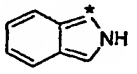
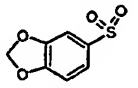
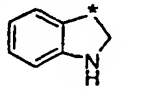
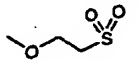
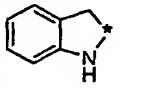
A76						D76	
A77						D77	
A78						D78	
A79						D79	
A80						D80	
A81						D81	
A82						D82	
A83						D83	

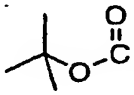
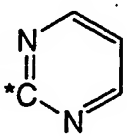
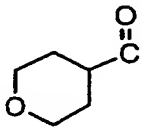
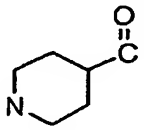
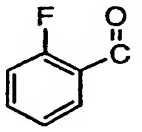
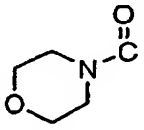
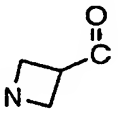
A84						D84	
A85						D85	
A86						D86	
A87						D87	
A88						D88	
A89						D89	
A90						D90	
A91						D91	

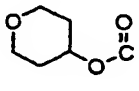
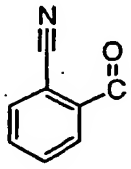
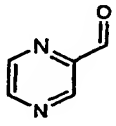
A92						D92	
A93						D93	
A94						D94	
A95						D95	
A96						D96	
A97						D97	
A98						D98	
A99						D99	

A100						D100	
A101						D101	
A102						D102	
A103						D103	
A104						D104	
A105						D105	
A106						D106	

A107						D107	
A108						D108	
A109						D109	
A110						D110	
A111						D111	
A112						D112	
A113						D113	
A114						D114	

A115						D115	
A116						D116	
A117						D117	
A118						D118	
A119						D119	
A120						D120	
A121						D121	
A122						D122	

A123						D123	
A124							
A125							
A126							
A127							
A128							
A129							

A130							
A131							
A132							
A133							

[0254] While any combination of the elements A, B and C may comprise the compounds of the Invention, certain combinations are preferred. For example, the following combinations

A11-B5-C4-D1	A17-B5-C4-D1	A66-B5-C4-D1	A75-B5-C4-D1
A128-B5-C4-D1	A11-B6-C4-D1	A17-B6-C4-D1	A66-B6-C4-D1
A75-B6-C4-D1	A128-B6-C4-D1	A11-B8-C4-D1	A17-B8-C4-D1
A66-B8-C4-D1	A75-B8-C4-D1	A128-B8-C4-D1	A11-B12-C4-D1
A17-B12-C4-D1	A66-B12-C4-D1	A75-B12-C4-D1	A128-B12-C4-D1
A11-B11-C4-D1	A17-B11-C4-D1	A66-B11-C4-D1	A75-B11-C4-D1
A128-B11-C4-D1	A11-B14-C4-D1	A17-B14-C4-D1	A66-B14-C4-D1
A75-B14-C4-D1	A128-B14-C4-D1	A11-B5-C4-D2	A17-B5-C4-D2
A66-B5-C4-D2	A75-B5-C4-D2	A128-B5-C4-D2	A11-B6-C4-D2
A17-B6-C4-D2	A66-B6-C4-D2	A75-B6-C4-D2	A128-B6-C4-D2
A11-B8-C4-D2	A17-B8-C4-D2	A66-B8-C4-D2	A75-B8-C4-D2
A128-B8-C4-D2	A11-B12-C4-D2	A17-B12-C4-D2	A66-B12-C4-D2
A75-B12-C4-D2	A128-B12-C4-D2	A11-B11-C4-D2	A17-B11-C4-D2
A66-B11-C4-D2	A75-B11-C4-D2	A128-B11-C4-D2	A11-B14-C4-D2
A17-B14-C4-D2	A66-B14-C4-D2	A75-B14-C4-D2	A128-B14-C4-D2

(continued)

A61-B5-C4-D1	A64-B5-C4-D1	A37-B5-C4-D1	A38-B5-C4-D1
A90-B5-C4-D1	A92-B5-C4-D1	A133-B5-C4-D1	A61-B6-C4-D1
A64-B6-C4-D1	A37-B6-C4-D1	A38-B6-C4-D1	A90-B6-C4-D1
A92-B6-C4-D1	A133-B6-C4-D1	A61-B12-C4-D1	A64-B12-C4-D1
A37-B12-C4-D1	A38-B12-C4-D1	A90-B12-C4-D1	A92-B12-C4-D1
A133-B12-C4-D1			
A11-B31-C4-D1	A75-B31-C4-D1	A128-B31-C4-D1	A11-B13-C4-D1
A75-B13-C4-D1	A128-B13-C4-D1	A11-B21-C4-D1	A75-B21-C4-D1
A128-B21-C4-D1	A11-B46-C4-D1	A75-B46-C4-D1	A128-B46-C4-D1
A11-B49-C4-D1	A75-B49-C4-D1	A128-B49-C4-D1	A11-B50-C4-D1
A75-B50-C4-D1	A128-B50-C4-D1	A11-B51-C4-D1	A75-B51-C4-D1
A128-B51-C4-D1	A11-B52-C4-D1	A75-B52-C4-D1	A128-B52-C4-D1
A11-B53-C4-D1	A75-B53-C4-D1	A128-B53-C4-D1	
A11-B5-C36-D1	A75-B5-C36-D1	A128-B5-C36-D1	A11-B6-C36-D1
A75-B6-C36-D1	A128-B6-C36-D1	A11-B12-C36-D1	A75-B12-C36-D1
A128-B12-C36-D1	A11-B5-C11-D1	A75-B5-C11-D1	A128-B5-C11-D1
A11-B6-C11-D1	A75-B6-C11-D1	A128-B6-C11-D1	A11-B12-C11-D1
A75-B12-C11-D1	A128-B12-C11-D1	A11-B5-C10-D1	A75-B5-C10-D1
A128-B5-C10-D1	A11-B6-C10-D1	A75-B6-C10-D1	A128-B6-C10-D1
A11-B12-C10-D1	A75-B12-C10-D1	A128-B12-C10-D1	A11-B5-C35-D1
A75-B5-C35-D1	A128-B5-C35-D1	A11-B6-C35-D1	A75-B6-C35-D1
A128-B6-C35-D1	A11-B12-C35-D1	A75-B12-C35-D1	A128-B12-C35-D1
A11-B5-C4-D33	A75-B5-C4-D33	A128-B5-C4-D33	A11-B6-C4-D33
A75-B6-C4-D33	A128-B6-C4-D33	A11-B12-C4-D33	A75-B12-C4-D33
A128-B12-C4-D33	A11-B5-C4-D83	A75-B5-C4-D83	A128-B5-C4-D83
A11-B6-C4-D83	A75-B6-C4-D83	A128-B6-C4-D83	A11-B12-C4-D83
A75-B12-C4-D83	A128-B12-C4-D83	A11-B5-C4-D86	A75-B5-C4-D86
A128-B5-C4-D86	A11-B6-C4-D86	A75-B6-C4-D86	A128-B6-C4-D86
A11-B12-C4-D86	A75-B12-C4-D86	A128-B12-C4-D86	A11-B5-C4-D123
A75-B5-C4-D123	A128-B5-C4-D123	A11-B6-C4-D123	A75-B6-C4-D123
A128-B6-C4-D123	A11-B12-C4-D123	A75-B12-C4-D123	A128-B12-C4-D123

EXAMPLE 28

Cathepsin B Assay

[0255] Solutions of test compounds in varying concentrations were prepared in 10 μL of dimethyl sulfoxide (DMSO) and then diluted into assay buffer (40 μL, comprising: *N,N*-bis(2-hydroxyethyl)-2-aminoethanesulfonic acid (BES), 50 mM (pH 6); polyoxyethylenesorbitan monolaurate, 0.05%; and dithiothreitol (DTT), 2.5 mM). Human cathepsin B (0.025 pMoles in 25 μL of assay buffer) was added to the dilutions. The assay solutions were mixed for 5-10 seconds on a shaker plate, covered and incubated for 30 minutes at room temperature. Z-FR-AMC (20 nMoles in 25 μL of assay buffer) was added to the assay solutions and hydrolysis was followed spectrophotometrically at (λ 460 nm) for 5 minutes. Apparent inhibition constants (K_i) were calculated from the enzyme progress curves using standard mathematical models.

[0256] Compounds of the invention were tested by the above-described assay and observed to exhibit cathepsin B inhibitory activity with a K_i of less than or equal to 10 μM.

EXAMPLE 29

Cathepsin K Assay

[0257] Solutions of test compounds in varying concentrations were prepared in 10 μL of dimethyl sulfoxide (DMSO) and then diluted into assay buffer (40 μL, comprising: MES, 50 mM (pH 5.5); EDTA, 2.5 mM; and DTT, 2.5 mM). Human cathepsin K (0.0906 pMoles in 25 μL of assay buffer) was added to the dilutions. The assay solutions were mixed for 5-10 seconds on a shaker plate, covered and incubated for 30 minutes at room temperature. Z-Phe-Arg-AMC (4 nMoles in 25 μL of assay buffer) was added to the assay solutions and hydrolysis was followed spectrophotometrically at (λ 460 nm) for 5 minutes. Apparent inhibition constants (K_i) were calculated from the enzyme progress curves using standard mathematical models.

[0258] Compounds of the invention were tested by the above-described assay and observed to exhibit cathepsin K inhibitory activity with a K_i of less than or equal to 10 μM.

EXAMPLE 30

Cathepsin L Assay

[0259] Solutions of test compounds in varying concentrations were prepared in 10 μL of dimethyl sulfoxide (DMSO) and then diluted into assay buffer (40 μL, comprising: MES, 50 mM (pH 5.5); EDTA, 2.5 mM; and DTT, 2.5 mM). Human cathepsin L (0.05 pMoles in 25 μL of assay buffer) was added to the dilutions. The assay solutions were mixed for 5-10 seconds on a shaker plate, covered and incubated for 30 minutes at room temperature. Z-Phe-Arg-AMC (1 nMoles in 25 μL of assay buffer) was added to the assay solutions and hydrolysis was followed spectrophotometrically at (λ 460 nm) for 5 minutes. Apparent inhibition constants (K_i) were calculated from the enzyme progress curves using standard mathematical models.

[0260] Compounds of the invention were tested by the above-described assay and observed to exhibit cathepsin L inhibitory activity with a K_i of less than or equal to 10 μM.

EXAMPLE 31

Cathepsin S Assay

[0261] Solutions of test compounds in varying concentrations were prepared in 10 μL of dimethyl sulfoxide (DMSO) and then diluted into assay buffer (40 μL, comprising: MES, 50 mM (pH 6.5); EDTA, 2.5 mM; and NaCl, 100 mM). Human cathepsin S (0.158 pMoles in 25 μL of assay buffer) was added to the dilutions. The assay solutions were mixed for 5-10 seconds on a shaker plate, covered and incubated for 30 minutes at room temperature. Z-Val-Val-Arg-AMC (9 nMoles in 25 μL of assay buffer) was added to the assay solutions and hydrolysis was followed spectrophotometrically at (λ 460 nm) for 5 minutes. Apparent inhibition constants (K_i) were calculated from the enzyme progress curves using standard mathematical models.

[0262] Compounds of the invention were tested by the above-described assay and observed to exhibit cathepsin S inhibitory activity with a K_i of less than or equal to 10 μM.

EXAMPLE 32

Ovalbumin Challenge Mouse

[0263] C57 mice (female) were sensitised with ovalbumin (10μg, i.p.) administered together with aluminium hydroxide adjuvant (20 mg, i.p.) on days 0 and 12. Mice are challenged on either day 22,23 or 24 by exposure for 60 minutes to an aerosol of ovalbumin (10 g /l) twice, 4 hours apart. Mice are dosed p.o. with either vehicle 5 ml/kg (0.5%MC/0.2 % Tween 80 in H_2O) or test compound at 0, 8, 23.5 29, 33, 48 and 56 hours.

[0264] Mice were euthanized with pentobarbitone i.p. after 86 hours (72 hours after the first challenge). The lungs were insufflated for histological examination as soon as possible after euthanization. Lungs were insufflated with 10% neutral buffered formalin (NBF), at 30 cm water pressure. The lungs were removed and placed in pots of 10% NBF. After fixation in 10% NBF for a minimum of 24 hours the lungs were processed through graded alcohols to wax. The lungs were blocked longitudinally and one 2 μm section for each animal was cut at the level of the main bronchi. Sections then were stained with haematoxylin and eosin. Pathological assessment of sections is performed and a grading is assigned.

[0265] Histopathological evaluation of the lung tissue demonstrate a dose dependant antiinflammatory effect on

vascular and mucosal beds after treatment with compounds of the invention between 0.03 and 30 mg/kg.

EXAMPLE 32

[0266] Representative Pharmaceutical Formulations Containing a Compound of Formula I

ORAL FORMULATION	
Compound of Formula I	10-100 mg
Citric Acid Monohydrate	105 mg
Sodium Hydroxide	18 mg
Flavoring	
Water	q.s. to 100 mL

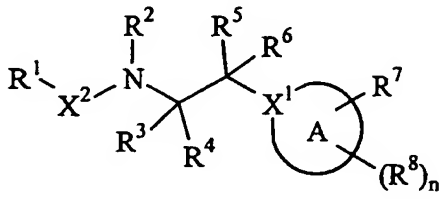
INTRAVENOUS FORMULATION	
Compound of Formula I	0.1-10 mg
Dextrose Monohydrate	q.s. to make isotonic
Citric Acid Monohydrate	1.05 mg
Sodium Hydroxide	0.18 mg
Water for Injection	q.s. to 1.0 mL

TABLET FORMULATION	
Compound of Formula I	1%
Microcrystalline Cellulose	73%
Stearic Acid	25%
Colloidal Silica	1%.

[0267] The resulting tablets are useful for administration in accordance with the methods of this invention for treating or preventing a cathepsin mediated disease state, such as osteoporosis, juvenile onset diabetes, multiple sclerosis, pemphigus vulgaris, Graves' disease, myasthenia gravis, systemic lupus erythemotasus, rheumatoid arthritis, Hashimoto's thyroiditis, asthma, organ transplant or tissue graft rejections, chronic obstructive pulmonary disease, bronchiolitis, excessive airway elastolysis in asthma and bronchitis, pneumonities, plaque rupture, atheroma and systemic amyloidosis.

Claims

1. A compound of Formula I:

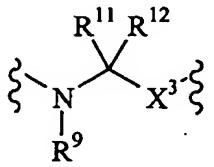


I

in which:

A comprises a benzooxazole or naphthooxazole ring, each substituted by a group R^7 and optionally substituted

with a group R^8, wherein R^7 is hydrogen, halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl, nitro or phenyl, R^8 at each occurrence independently is halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl, nitro or trifluoromethyl;
n is 0, 1, 2 or 3;
X^1 is =C-;
X^2 is a bond or a divalent group of Formula (a):



(a)

X^3 is -C-(O) or $-CH_2S(O)_2$-;

wherein within Formula (a) R^9 is hydrogen, R^{11} is hydrogen or methyl and R^{12} is (C_{1-6})alkyl substituted with $-SR^{14}$, $-S(O)R^{14}$ or $-S(O)_2R^{14}$, wherein R^{14} is (C_{6-12})aryl(C_{0-6})alkyl or hetero(C_{5-12})aryl(C_{0-6})alkyl; wherein within R^{12} the aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl;

R^1 is $-X^6X^7R^{20}$, wherein X^6 is -C(O)- or $-S(O)_2$-, X^7 is a bond, -O- or $-NR^{21}$-, wherein R^{21} is hydrogen or (C_{1-6})alkyl, and R^{20} is (i) (C_{1-6})alkyl optionally substituted by $-C(O)OR^{14}$ or (ii) (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl or hetero(C_{5-12})aryl(C_{0-6})alkyl or (iii) (C_{3-6})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6})alkyl or hetero(C_{5-6})aryl(C_{0-6})alkyl, wherein said cycloalkyl, heterocycloalkyl, phenyl or heteroaryl is substituted by $-X^5OR^{24}$,$-X^5C(O)R^{24}$, $-X^5C(O)OR^{24}$, $-X^5C(O)NR^{24}R^{25}$, $-X^5NR^{24}R^{25}$, $-X^5NR^{25}C(O)R^{24}$, $-X^5NR^{25}C(O)OR^{24}$, $-X^5NR^{25}C(O)NR^{24}R^{25}$ or $-X^5NR^{25}C(NR^{25})NR^{24}R^{25}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{24} is (C_{3-6})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6})alkyl or hetero(C_{5-6})aryl(C_{5-6})alkyl and R^{25} is hydrogen or (C_{1-6})alkyl; wherein within R^1 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 substituents independently selected from (C_{1-6})alkyl, halo, halo-substituted (C_{1-4})alkyl, $-OR^{14}$ and $-C(O)OR^{14}$ wherein R^{14} is as defined above, or when X^2 is a divalent group of formula (a) then R^1 may be, but is not limited to, hydrogen or oxalo;

R^2 is hydrogen;

R^3 is hydrogen, (C_{1-6})alkyl (optionally substituted with cyano, halo, nitro, $-SR^{24}$, $-C(O)OR^{24}$, $-C(O)NR^{24}R^{24}$, $-P(O)(OR^{24})OR^{24}$, $-OP(O)(OR^{24})OR^{24}$, $-S(O)R^{25}$, $-S(O)_2R^{25}$ or $-C(O)R^{25}$, wherein R^{24} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{25} is halo, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl) or (C_{6-12})aryl(C_{2-3})alkyl, wherein said aryl optionally is substituted further with 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro,$-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-6})alkylene and R^{14} and R^{15} are as defined above, or R^3 and R^4 or R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form cyclopropylene, cyclobutylene, cyclopentylene or cyclohexylene;

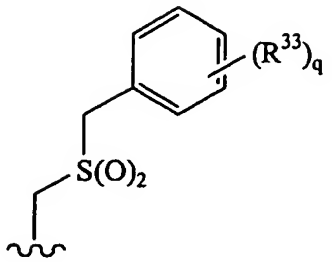
R^4 is hydrogen or as defined above; and

R^5 and R^6 together form oxo; and the *N*-oxide derivatives, and individual stereoisomers and mixtures of stereoisomers thereof; and the pharmaceutically acceptable salts thereof.

2. The compound of Claim **1** in which:

A is benzoxazol-2-yl substituted by R^7, wherein R^7 is hydrogen, halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl or nitro and R^8 at each occurrence independently is halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl, nitro or trifluoromethyl;
X^2 is a bond or a divalent group of Formula (a), wherein within Formula (a) X^3 is -C(O)-, R^{11} is hydrogen and

R^{12} is a group having the following formula:



in which q is 0, 1, 2, 4 or 5 and R^{33} at each occurrence independently is selected from a group consisting of (C_{1-4}) alkyl, cyano, halo, halo-substituted (C_{1-4}alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(C)NR^{14}R^{14}$, $-X^5C(O)OR^{14}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} is (C_{1-3})alkyl or halo-substituted (C_{1-3}) alkyl;

R^1 is selected from a group consisting of acetyl, azetidin-3-ylcarbonyl, benzyloxycarbonyl, 1-benzyloxycarbonylpiperidin-4-ylcarbonyl, benzylsulfonyl, bicyclo[2.2.2]hept-2-ylcarbonyl, bicyclo[2.2.1]hept-2-ylcarbonyl, *tert*-butoxycarbonyl, carboxyacetyl, 2-carboxypropionyl, 3-carboxypropionyl, 2-cyclohexylacetyl, 4-cyclohexylbutyryl, 2-cyclohexylethylsulfonyl, cyclohexylmethoxycarbonyl, 3-cyclohexylpropionyl, 2-cyclopentylethylsulfonyl, 3-cyclopentylpropionyl, di(2-methoxyethyl)carbamoyl, dimethylcarbamoyl, 6-hydroxypyrid-3-ylcarbonyl, 1*H*-imidazol-4-ylcarbonyl, methoxycarbonyl, methylsulfonyl, 4-methylvaleryl, morpholin-4-ylcarbonyl, 2-morpholin-4-ylethylcarbonyl, naphth-1-ylacetyl, naphth-1-ylmethylcarbonyl, oxalo, 3-phenylpropionyl, piperazin-1-ylcarbonyl, piperidin-4-ylcarbonyl, pyrazin-2-ylcarbonyl, pyrid-3-ylcarbonyl, pyrid-4-ylcarbonyl, pyrid-3-ylaminocarbonyl, tetrahydropyran-4-ylcarbonyl and tetrahyd ropyran-4-yloxycarbonyl;

R^3 is selected from hydrogen, (C_{1-4})alky), phenyl(C_{2-3})alkyl or (C_{1-4})alkylsulfonyl(C_{2-4})alkyl or R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-6})cycloalkylene;

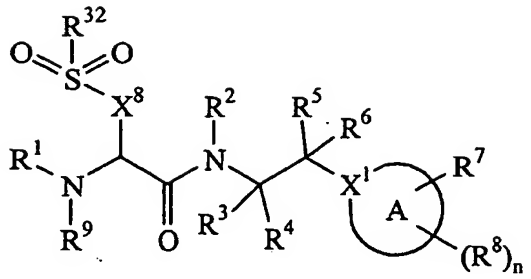
R^4 is hydrogen or as defined above; and the *N*-oxide derivatives, and individual stereoisomers and mixtures of stereoisomers thereof; and the pharmaceutically acceptable salts thereof.

3. The compound of Claim **2** in which q is 0, 1 or 2, R^1 is morpholin-4-ylcarbonyl, methoxycarbonyl, methylsulfonyl, piperidin-4-ylcarbonyl, pyrazin-2-ylcarbonyl pyrid-3-ylcarbonyl, pyrid-4-ylcarbonyl, tetrahydropyran-4-ylcarbonyl or tetrahydropyran-4-yloxycarbonyl, R^3 is methyl, ethyl, *n*-propyl, *n*-butyl, 2-methylsulfonylethyl or phenyethyl or R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form cyclobutylene and R^{33} at each occurrence independently is (C_{1-4})alkyl, cyano, halo, halo-subsituted (C_{1-4})alkyl, nitro, $-OR^{14}$, $-SR^{14}$ or -C(O)OR^{14}, wherein R^{14} at each occurrence independently is hydrogen, (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl; and the *N*-oxide derivatives, and individual stereoisomers and mixtures of stereoisomers thereof; and the pharmaceutically acceptable salts thereof.

4. The compound of Claim **3** in which R^{33} at each occurrence independently is selected from a group consisting of (C_{1-4})alkyl, bromo, carboxy, chloro, cyano, difluoromethoxy, fluoro, iodo, methoxy, nitro, trifluoromethoxy, trifluoromethyl and trifluorosulfanyl; and the *N*-oxide derivatives, and individual stereoisomers and mixtures of stereoisomers thereof; and the pharmaceutically acceptable salts thereof.

5. The compound of Claim **1** in which within Formula (a) R^{12} is benzylsulfonylmethyl, 2-chlorobenzylsulfonylmethyl, 2-cyanobenzylsulfonylmethyl, 2-difluoromethoxybenzylsulfonylmethyl, 3,5-dimethylisooxazol-4-ylmethylsulfonylmethyl, 2-methoxybenzylsulfonylmethyl, 6-methylpyrid-2-ylmethylsulfonylmethyl, 2-nitrobenzylsulfonylmethyl, pyrid-2-ylmethylsulfonylmethyl, *o*-tolylmethylsulfonylmethyl or 2-trifluoromethylbenzylsulfonylmethyl; and the *N*-oxide derivatives, and individual stereoisomers and mixtures of stereoisomers thereof; and the pharmaceutically acceptable salts thereof.

6. A compound of Formula II:



II

in which:

A comprises a benzooxazole or naphthooxazole ring wherein X^1 is a ring member carbon atom;
n is 0, 1, 2 or 3;
X^1 is =C- or -CH-;
X^8 is (C_{1-2})alkylene;
R^1 is hydrogen, carboxy, oxalo, carbamoyl or $-X^6X^7R^{20}$, wherein X^6 is -C(O)-, -C(O)C(O)- or $-S(O)_2-$, X^7 is a bond, -O- or $-NR^{21}-$, wherein R^{21} is hydrogen or (C_{1-6})alkyl, and R^{20} is (i) (C_{1-6})alkyl optionally substituted by cyano, halo, nitro, $-NR^{14}R^{14}$, $-NR^{14}C(O)OR^{14}$, $-NR^{14}C(O)NR^{14}R^{14}$, $-NR^{14}C(NR^{14})NR^{14}R^{14}$, $-OR^{14}$, $-SR^{14}$, $-C(O)OR^{14}$, $-C(O)NR^{14}R^{14}$, $-S(O)_2NR^{14}R^{14}$, $-P(O)(OR^{14})OR^{14}$, $-OP(O)(OR^{14})OR^{14}$, $-NR^{14}C(O)R^{15}$, $-S(O)R^{15}$, $-S(O)_2R^{15}$, $-C(O)R^{15}$, $-OR^{22}$, $-SR^{22}$, $-S(O)R^{22}$, $-S(O)_2R^{22}$, $-C(O)R^{22}$, $-C(O)OR^{22}$, $-C(O)NR^{22}R^{23}$, $-NR^{22}R^{23}$, $-NR^{23}C(O)R^{22}$, $-NR^{23}C(O)OR^{22}$,$-NR^{23}C(O)NR^{22}R^{23}$ or $-NR^{23}C(NR^{23})NR^{22}R^{23}$, wherein R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, R^{15} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, R^{22} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alky), (C_{9-12})bicycloaryl(C_{0-6})alkyl or hetero(C_{8-12})bicycloaryl(C_{0-6})alkyl and R^{23} at each occurrence independently is hydrogen or (C_{1-6})alkyl, or (ii) (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})bicycloaryl(C_{0-6})alkyl or hetero (C_{8-12})bicycloaryl(C_{0-6})alkyl or (iii) (C_{3-6})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6}) alkyl or hetero(C_{5-6})aryl(C_{0-6})alkyl substituted by $-X^5OR^{24}$, $-X^5SR^{24}$, $-X^5S(O)R^{24}$, $-X^5S(O)_2R^{24}$, $-X^5C(O)R^{24}$, $-X^5C(O)OR^{24}$, $-X^5C(O)NR^{24}R^{25}$, $-X^5NR^{24}R^{25}$, $-X^5NR^{25}C(O)R^{24}$, $-X^5NR^{25}C(O)OR^{24}$, $-X^5NR^{25}C(O)NR^{24}R^{25}$ or $-X^5NR^{25}C(NR^{25})NR^{24}R^{25}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{24} is (C_{3-6})cycloalkyl(C_{0-6})alkyl, hetero (C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6})alkyl or hetero(C_{5-6})aryl(C_{0-6})alkyl and R^{25} at each occurrence independently is hydrogen or (C_{1-6})alkyl; wherein within R^1 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above;
R^2 is hydrogen or (C_{1-6})alkyl;
R^3 is (i) (C_{1-6})alkyl optionally substituted with cyano, halo, nitro, $-NR^{14}R^{14}$, $-NR^{14}C(O)OR^{14}$, $-NR^{14}C(O)NR^{14}R^{14}$, $-NR^{14}C(NR^{14})NR^{14}R^{14}$, $-OR^{14}$, $-SR^{14}$, $-C(O)OR^{14}$, $-C(O)NR^{14}R^{14}$, $-S(O)_2NR^{14}R^{14}$, $-P(O)(OR^{14})OR^{14}$, $-OP(O)(OR^{14})OR^{14}$, $-NR^{14}C(O)R^{15}$, $-S(O)R^{15}$, $-S(O)_2R^{15}$, $-C(O)R^{15}$, $-OR^{16}$, $-SR^{16}$, $-S(O)R^{16}$, $S(O)_2R^{16}$, $-C(O)R^{16}$, $-C(O)OR^{16}$, $-OC(O)R^{16}$, $-NR^{16}R^{17}$, $-NR^{17}C(O)R^{16}$, $-NR^{17}C(O)OR^{16}$, $-C(O)NR^{16}R^{17}$, $-S(O)_2NR^{16}R^{17}$, $-NR^{17}C(O)NR^{16}R^{17}$ or $-NR^{17}C(NR^{17})NR^{16}R^{17}$, wherein R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, R^{15} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl, R^{16} is (C_{3-12})cycloalkyl(C_{1-6})alkyl, hetero(C_{3-12})cycloalkyl$(_{0-6})$alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})ary)(C_{0-6}) alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl or hetero(C_{81-2})polycycloaryl(C_{0-6})alkyl and R^{17} is hydrogen or (C_{1-6}) alkyl, and wherein within R^{16} said cycloalkyl, heterocycloalkyl, aryl, heteroaryl, polycycloaryl or heterpolycycloaryl ring optionally is substituted by a group selected from $-R^{18}$, $-X^5OR^{18}$, $-X^5SR^{18}$, $-X^5S(O)R^{18}$, $-X^5S(O)_2R^{18}$, $-X^5C(O)R^{18}$, $-X^5C(O)OR^{18}$, $-X^5OC(O)R^{18}$, $-X^5NR^{18}R^{19}$, $-X^5NR^{19}C(O)R^{18}$, $-X^5NR^{19}C(O)OR^{18}$, $-X^5C(O)NR^{18}R^{19}$, $-X^5S(O)_2NR^{18}R19$, $-X^5NR^{19}C(O)NR^{18}R^{19}$ or $-X^5NR^{19}C(NR^{19})NR^{18}R^{19}$, wherein X^5 is as defined above, R^{18} is hydrogen or (C_{1-6})alkyl and R^{19} is (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl, or (ii) a group selected from (C_{3-12})cycloalkyl(C_{0-6})a)ky), hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl,

(C_{6-12})aryl(C_{0-6})alkyl, hetero(C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl and hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl, wherein said cycloalkyl, heterocycloalkyl, aryl, heteroaryl, polycycloaryl or heterpolycycloaryl ring optionally is substituted by a group selected from $-R^{18}$, $-X^5OR^{18}$, $-X^5SR^{18}$, $-X^5S(O)R^{18}$, $-X^5S(O)_2R^{18}$, $-X^5C(O)R^{18}$, $-X^5C(O)OR^{18}$, $-X^5OC(O)R^{18}$, $-X^5NR^{18}R^{19}$, $-X^5NR^{19}C(O)R^{18}$, $-X^5NR^{19}C(O)OR^{18}$, $-X^5C(O)NR^{18}R^{19}$, $-X^5S(O)_2NR^{18}R^{19}$, $-X^5NR^{19}C(O)NR^{18}R^{19}$ or $-X^5NR^{19}C(NR^{19})NR^{18}R^{19}$, wherein X^5, R^{18} and R^{19} are as defined above; wherein within R^{12} and/or R^{13} any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above, or

R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-8})cycloalkylene or (C_{3-8})heterocycloalkylene, wherein said cycloalkylene or heterocycloalkylene is optionally substituted with 1 to 3 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above;

R^4 is hydrogen, (C_{1-6})alkyl or as defined above;

R^5 is hydrogen and R^6 is hydroxy or R^5 and R^6 together form oxo;

R^7 is a group selected from cyano, halo, nitro, $-R^{29}$, $-X^5NR^{29}R^{30}$, $-X^5NR^{30}C(O)OR^{29}$, $-X^5NR^{30}C(O)NR^{29}R^{30}$, $-X^5NR^{30}C(NR^{30})NR^{29}R^{30}$, $-X^5OR^{29}$, $-X^5SR^{29}$, $-X^5C(O)OR^{29}$, $-X^5C(O)NR^{29}R^{30}$, $-X^5S(O)_2NR^{29}R^{30}$, $-X^5P(O)(OR^{30})OR^{29}$, $-X^5OP(O)(OR^{29})OR^{29}$, $-X^5NR^{30}C(O)R^{31}$, $-X^5S(O)R^{31}$, $-X^5S(O)_2R^{31}$ and $-X^5C(O)R^{31}$, wherein X^5 is as defined above, R^{29} is hydrogen or $-R^{31}$, R^{30} at each occurrence is hydrogen or (C_{1-6})alkyl and R^{31} is (C_{1-6})alkyl, (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl or hetero (C_{5-12})aryl(C_{0-6})alkyl, wherein within R^7 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; and

R^8 at each occurrence independently is selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$ $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above;

R^9 is hydrogen or (C_{1-6})alkyl; and

R^{32} is (C_{1-8})alkyl, (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl, hetero (C_{5-12})aryl(C_{0-6})alkyl, (C_{9-12})polycycloaryl(C_{0-6})alkyl or hetero(C_{8-12})polycycloaryl(C_{0-6})alkyl, wherein within R^{32} any alicyclic or aromatic ring system present may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OR(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above; and the *N*-oxide derivatives and individual stereoisomers and mixtures of stereoisomers thereof; and the pharmaceutically acceptable salts thereof.

7. The compound of Claim **6** in which:

A is benzooxazol-2-yl substituted by a group R^7 and optionally substituted with a group R^8, wherein R^7 is hydrogen, halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl, nitro or phenyl, R^8 at each occurrence independently is halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl, nitro or trifluoromethyl;

X^1 is =C-

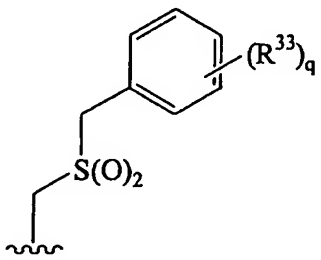
X^8 is methylene or ethylene;

R^1 is $-X^6X^7R^{20}$, wherein X^6 is -C(O)- or $-S(O)_2-$, X^7 is a bond, -O- or $-NR^{21}-$, wherein R^{21} is hydrogen or (C_{1-6})alkyl, and R^{20} is (i) (C_{1-6})alkyl optionally substituted by $-C(O)OR^{14}$ or (ii) (C_{3-12})cycloalkyl(C_{0-6})alkyl, hetero (C_{3-12})cycloalkyl(C_{0-6})alkyl, (C_{6-12})aryl(C_{0-6})alkyl or hetero(C_{5-12})aryl(C_{0-6})alkyl or (iii) (C_{3-6})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6})alkyl or hetero(C_{5-6})aryl(C_{0-6})alkyl, wherein said cycloalkyl, heterocycloalkyl, phenyl or heteroaryl is substituted by $-X^5OR^{24}$, $-X^5C(O)R^{24}$, $-X^5C(O)OR^{24}$, $-X^5C(O)$

$NR^{24}R^{25}$, $-X^5NR^{24}R^{25}$, $-X^5NR^{25}C(O)R^{24}$, $-X^5NR^{25}C(O)OR^{24}$, $-X^5NR^{25}C(O)NR^{24}R^{25}$ or $-X^5NR^{25}C(NR^{25})NR^{24}R^{25}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{24} is (C_{3-6})cycloalkyl(C_{0-6})alkyl, hetero(C_{3-6})cycloalkyl(C_{0-6})alkyl, phenyl(C_{0-6})alkyl or hetero(C_{5-6})aryl(C_{0-6})alkyl and R^{25} is hydrogen or (C_{1-6})alkyl; wherein within R^1 any alicyclic or aromatic ring system present may be substituted further by 1 to 5 substituents independently selected from (C_{1-6})alkyl, halo, halo-substituted (C_{1-4})alkyl, $-OR^{14}$ and $-C(O)OR^{14}$ wherein R^{14} is as defined above, or when X^2 is a divalent group of formula (a) then R^1 may be, but is not limited to, hydrogen or oxalo;
R^2 and R^9 each are hydrogen;
R^3 is hydrogen, (C_{1-6})alkyl (optionally substituted with cyano, halo, nitro, $-SR^{24}$, $-C(O)OR^{24}$, $-C(O)NR^{24}R^{24}$, $-P(O)(OR^{24})OR^{24}$, $-OP(O)(OR^{24})OR^{24}$, $-S(O)R^{25}$, $-S(O)_2R^{25}$ or $-C(O)R^{25}$, wherein R^{24} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{25} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl) or (C_{6-12})aryl(C_{2-3})alkyl, wherein said aryl optionally is substituted further with 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5, R^{14} and R^{15} are as defined above, or R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form cyclopropylene, cyclobutylene, cyclopentylene or cyclohexylene;
R^4 is hydrogen or as defined above;
R^5 and R^6 together form oxo; and
R^{32} is $-X^9R^{34}$, wherein X^9 is methylene when X^8 is methylene or is a bond when X^8 is ethylene, R^{34} is $-CR^{35}=CHR^{36}$ or $-CR^{37}=NR^{38}$, wherein R^{35} and R^{36} together with the atoms to which R^{35} and R^{36} are attached form (C_{2-6})alkenyl, (C_{5-12})cycloalkenyl, hetero(C_{5-12})cycloalkenyl, (C_{6-12})aryl, hetero(C_{6-12})aryl, (C_{9-12})bicycloaryl or hetero(C_{8-12})bicycloaryl and R^{37} and R^{38} together with the atoms to which R^{37} and R^{38} are attached form hetero(C_{5-12})cycloalkeny), hetero(C_{6-12})aryl or hetero(C_{8-12})bicycloaryl, wherein within R^{34} said cycloalkenyl, heterocycloalkenyl, aryl, heteroaryl, bicycloaryl or heterobicycloaryl may be substituted further by 1 to 5 radicals independently selected from (C_{1-6})alkyl, (C_{1-6})alkylidene, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5NR^{14}C(O)OR^{14}$, $-X^5NR^{14}C(O)NR^{14}R^{14}$, $-X^5NR^{14}C(NR^{14})NR^{14}R^{14}$, $-X^5OR^{14}$ $-X^5SR^{14}$, $-X^5C(O)OR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5S(O)_2NR^{14}R^{14}$, $-X^5P(O)(OR^{14})OR^{14}$, $-X^5OP(O)(OR^{14})OR^{14}$, $-X^5NR^{14}C(O)R^{15}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-6})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} is (C_{1-6})alkyl or halo-substituted (C_{1-3})alkyl; and the *N*-oxide derivatives and individual stereoisomers and mixtures of stereoisomers thereof; and the pharmaceutically acceptable salts thereof.

8. The compound of Claim 7 in which:

A is benzooxazol-2-yl, wherein R^7 is hydrogen, halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl or nitro and R^8 at each occurrence independently is halo, (C_{1-4})alkoxy, (C_{1-4})alkoxycarbonyl, nitro or trifluoromethyl;
$-X^8S(O)_2R^{32}$ is a group having the following formula:



in which q is 0, 1, 2, 4 or 5 and R^{33} at each occurrence independently is selected from a group consisting of (C_{1-4})alkyl, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$ $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5C(O)OR^{14}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$, wherein X^5 is a bond or (C_{1-2})alkylene, R^{14} at each occurrence independently is hydrogen, (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl and R^{15} is (C_{1-3})alkyl or halo-substituted (C_{1-3})alkyl;
R^1 is selected from a group consisting of acetyl, azetidin-3-ylcarbonyl, benzyloxycarbonyl, 1-benzyloxycarbonylpiperidin-4-ylcarbonyl, benzylsulfonyl, bicyclo[2.2.2]hept-2-ylcarbonyl, bicyclo[2.2.1]hept-2-ylcarbonyl,

tert-butoxycarbonyl, carboxyacetyl, 2-carboxypropionyl, 3-carboxypropionyl, 2-cyclohexylacetyl, 4-cyclohexylbutyryl, 2-cyclohexylethylsulfonyl, cyclohexylmethoxycarbonyl, 3-cyclohexylpropionyl, 2-cyclopentylethylsulfonyl, 3-cyclopentylpropionyl, di(2-methoxyethyl)carbamoyl, dimethylcarbamoyl, 6-hydroxypyrid-3-ylcarbonyl, 1*H*-imidazol-4-ylcarbonyl, methoxycarbonyl, methylsulfonyl, 4-methylvaleryl, morpholin-4-ylcarbonyl, 2-morpholin-4-ylethylcarbonyl, naphth-1-ylacetyl, naphth-1-ylmethylcarbonyl, oxalo, 3-phenylpropionyl, piperazin-1-ylcarbonyl, piperidin-4-ylcarbonyl, pyrazin-2-ylcarbonyl, pyrid-3-ylcarbonyl, pyrid-4-ylcarbonyl, pyrid-3-ylaminocarbonyl, tetrahydropyran-4-ylcarbonyl and tetrahydropyran-4-yloxycarbonyl;
R^3 is selected from hydrogen, (C_{1-4})a)ky), phenyl(C_{2-3})alkyl or (C_{1-4})alkylsulfonyl(C_{2-4})alkyl or R^3 and R^4 taken together with the carbon atom to which both R^3 and R^4 are attached form (C_{3-6})cycloalkylene;
R^4 is hydrogen or as defined above; and
R^{34} is (C_{6-12})aryl or hetero(C_{5-12})aryl, each optionally substituted by 1 to 5 radicals selected from a group consisting of (C_{1-4})alkyl, cyano, halo, halo-substituted (C_{1-4})alkyl, nitro, $-X^5NR^{14}R^{14}$, $-X^5OR^{14}$, $-X^5SR^{14}$, $-X^5C(O)NR^{14}R^{14}$, $-X^5C(O)OR^{14}$, $-X^5S(O)R^{15}$, $-X^5S(O)_2R^{15}$ and $-X^5C(O)R^{15}$,

wherein X^5, R^{14} and R^{15} are as defined above; and the *N*-oxide derivatives and individual stereoisomers and mixtures of stereoisomers thereof; and the pharmaceutically acceptable salts thereof.

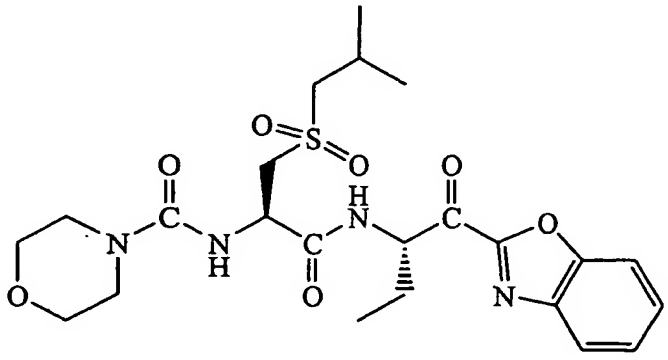
9. The compound of claim **6** in which q is 0, 1 or 2, R^1 is morpholin-4-ylcarbonyl, methoxycarbonyl, methylsulfonyl, piperidin-4-ylcarbonyl, pyrazin-2-ylcarbonyl, pyrid-3-ylcarbonyl, pyrid-4-ylcarbonyl, tetrahydropyran-4-ylcarbonyl or tetrahydropyran-4-yloxycarbonyl, R^3 is ethyl, butyl, 2-methylsulfonylethyl, phenethyl or propyl and $-X^8S(O)_2R^{32}$ is benzylsulfonylmethyl, 2-chlorobenzylsulfonylmethyl, 2-cyanobenzylsulfonylmethyl, 2-difluoromethoxybenzylsulfonylmethyl, 3,5-dimethylisooxazol-4-ylmethylsulfonylmethyl, 2-methoxybenzylsulfonylmethyl, 6-methylpyrid-2-ylmethylsulfonylmethyl, 2-nitrobenzylsulfonylmethyl, pyrid-2-ylmethylsulfonylmethyl, *o*-tolylmethylsulfonylmethyl or 2-trifluoromethylbenzylsulfonylmethyl; and the *N*-oxide derivatives and individual stereoisomers and mixtures of stereoisomers thereof; and the pharmaceutically acceptable salts thereof.

10. The compound of claim **9** selected from a group consisting of:

N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide;
methyl 1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-benzylsulfonylethylcarba mate;
N-(1*S*-benzooxazol-2-ylcarbonylbutyl)-2*R*-methylsulfonylamino-3-benzylsulfonylpropionamide;
N-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2*R*-(3,3-dimethylureido)-3-(2-methoxybenzylsulfonyl)propionamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylbutylcarbamoyl)-2-(2-methoxybenzylsulfonyl)ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-chlorobenzylsulfonyl)ethyl]morpholine-4-carboxamide;
1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethylcarbamate;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethyl]morpholine-4-carboxyamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(3,5-dimethylisoxazol-4-ylmethylsulfonylethyl]isonicotinamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-nitrobenzylsulfonyl)ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-pyridin-2-ylmethylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-o-tolylmethylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-trifluoromethylbenzylsulfonyl)ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]nicotinamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]pyrazine-2-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-chlorobenzylsulfonyl)ethyl]morpholine-4-carboxamide;

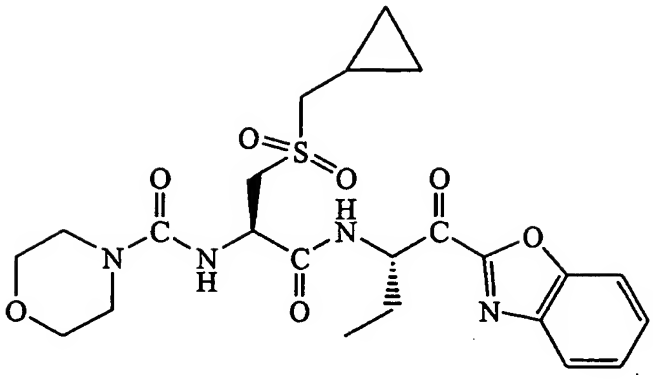
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-cyanobenzylsulfonyl)ethyl]isonicotinamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-methylsulfonylpropylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonylpentylcarbamoyl)-2-(2-difluoromethoxybenzylsulfonyl)ethyl]isonicotinamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl)-3-phenylpropylcarbamoyl)-2-benzylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(6-methylpyrid-2-ylmethylsulfonyl)ethyl] isonicotinamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-nitrobenzylsulfonyl)ethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-pyrid-2-ylmethylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-*o*-tolylmethylsulfonylethyl]morpholine-4-carboxamide;
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-trifluoromethylbenzylsulfonyl)ethyl]tetrahydropyran-4-carboxamide;
tetrahydropyran-4-yl 1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-benzylsulfonylethylcarbamate; and
N-[1*R*-(1*S*-benzooxazol-2-ylcarbonyl-3-phenylpropylcarbamoyl)-2-(2-cyanobenzylsulfonyl)ethyl]piperidine-4-carbox amide; and the *N*-oxide derivatives and individual stereoisomers and mixtures of stereoisomers thereof; and the pharmaceutically acceptable salts thereof.

11. The compound of Claim **6** which is A128-B14-C4-D1 of Table 1 and having the structure:



namely *N*-[1*R*-(1*S*-benzooxazol-2-ylcarbonylprop-1-ylcarbamoyl)-2-(2-methylprop-1-ylsulfonyl)ethyl]morpholine-4-carboxamide; and the pharmaceutically acceptable salts thereof.

12. The compound of Claim **6** designated as A128-B46-C4-D1 of Table 1 and having the structure:



namely *N*-[1*R*-(1*S*-benzooxazol-2-ylcarbonylprop-1-ylcarbamoyl)-2-cyclopropylmethylsulfonylethyl]morpholine-4-carboxamide; and the pharmaceutically acceptable salts thereof.

13. A pharmaceutical composition comprising a compound of claim **6** or a *N*-oxide derivative thereof; or an individual stereoisomer or mixture of stereoisomers thereof; or a pharmaceutically acceptable salt thereof in admixture with one or more suitable excipients.

14. A pharmaceutical composition comprising a compound of Claim **1**, or a *N*-oxide derivative, individual stereoisomer, or mixture of stereoisomers thereof, or a pharmaceutically acceptable salt thereof in admixture with one or more suitable excipients.

15. A method of treating a disease selected from juvenile onset diabetes, multiple sclerosis, pemphigus vulgaris, rheumatoid arthritis, Hashimoto's thyroiditis, asthma, organ transplant or tissue graft rejections, chronic obstructive pulmonary disease, bronchiolitis, excessive airway elastolysis in asthma and bronchitis, pneumonities, plaque rupture and atheroma in an animal in need of such treatment, which method comprises administering a compound of Claim **1** to the animal; or a *N*-oxide derivative thereof; or an individual stereoisomer or mixture of stereoisomers thereof; or a pharmaceutically acceptable salt thereof.

16. A method of treating a disease selected from juvenile onset diabetes, multiple sclerosis, pemphigus vulgaris, rheumatoid arthritis, Hashimoto's thyroiditis, asthma, organ transplant or tissue graft rejections, chronic obstructive pulmonary disease, bronchiolitis, excessive airway elastolysis in asthma and bronchitis, pneumonities, plaque rupture and atheroma in an animal in need of such treatment, which method comprises administering a compound of Claim 8 to the animal; or a *N*-oxide derivative thereof; or an individual stereoisomer or mixture of stereoisomers thereof; or a pharmaceutically acceptable salt thereof.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 01 5656

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	OGILVIE W ET AL: "PEPTIDOMIMETIC INHIBITORS OF THE HUMAN CYTOMEGALOVIRUS PROTEASE" JOURNAL OF MEDICINAL CHEMISTRY,US,AMERICAN CHEMICAL SOCIETY. WASHINGTON, vol. 40, no. 25, 5 December 1997 (1997-12-05), pages 4113-4135, XP002065953 ISSN: 0022-2623 * page 4118; examples 77,82-85; table 6 *	1-8	C07D263/56 A61K31/42 C07D263/34 C07D413/12 A61K31/44 C07D213/40 C07D209/14 C07D307/81 A61P37/00 A61P9/00
X	WO 96/21655 A (HOECHST MARION ROUSSEL INC) 18 July 1996 (1996-07-18) * claim 1 *	1-8	
A	WO 98/49190 A (CORTECH INC ;LEIMER AXEL H (US); SPRUCE LYLE W (US); CHERONIS JOHN) 5 November 1998 (1998-11-05) * page 20 - page 21; claim 1 *	1-53	
A	WO 96/40744 A (COR THERAPEUTICS INC ;MARLOWE CHARLES K (US); SCARBOROUGH ROBERT M) 19 December 1996 (1996-12-19) * claim 1 *	1-53	TECHNICAL FIELDS SEARCHED (Int.Cl.7) C07D A61K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	14 October 2004	Lauro, P

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 01 5656

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

14-10-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9621655 A	18-07-1996	AT 206413 T	15-10-2001
		AU 692044 B2	28-05-1998
		AU 4473196 A	31-07-1996
		CA 2210258 A1	18-07-1996
		CN 1173174 A ,B	11-02-1998
		DE 69523072 D1	08-11-2001
		DE 69523072 T2	20-06-2002
		DK 802909 T3	28-01-2002
		EP 0802909 A2	29-10-1997
		ES 2165441 T3	16-03-2002
		FI 972935 A	10-07-1997
		HU 77649 A2	28-07-1998
		IL 116724 A	31-08-2000
		JP 10512257 T	24-11-1998
		NO 973216 A	09-09-1997
		NZ 298999 A	28-01-1999
		PT 802909 T	28-03-2002
		SI 802909 T1	28-02-2002
		TW 454001 B	11-09-2001
		WO 9621655 A2	18-07-1996
		US 5691368 A	25-11-1997
		ZA 9600100 A	24-07-1996
WO 9849190 A	05-11-1998	US 6004933 A	21-12-1999
		AU 7155698 A	24-11-1998
		EP 0979242 A2	16-02-2000
		WO 9849190 A2	05-11-1998
		AU 750369 B2	18-07-2002
		AU 3965199 A	08-11-1999
		CA 2329712 A1	28-10-1999
		NZ 507696 A	31-10-2003
		WO 9954317 A1	28-10-1999
WO 9640744 A	19-12-1996	US 6069130 A	30-05-2000
		AU 702360 B2	18-02-1999
		AU 6476196 A	30-12-1996
		CA 2224180 A1	19-12-1996
		EP 0832102 A1	01-04-1998
		JP 11507337 T	29-06-1999
		NZ 312840 A	29-11-1999
		US 6197748 B1	06-03-2001
		WO 9640744 A1	19-12-1996
		ZA 9604754 A	11-03-1997

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

This Page is Inserted by IFW Indexing and Scanning Operations and is not part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.
As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.